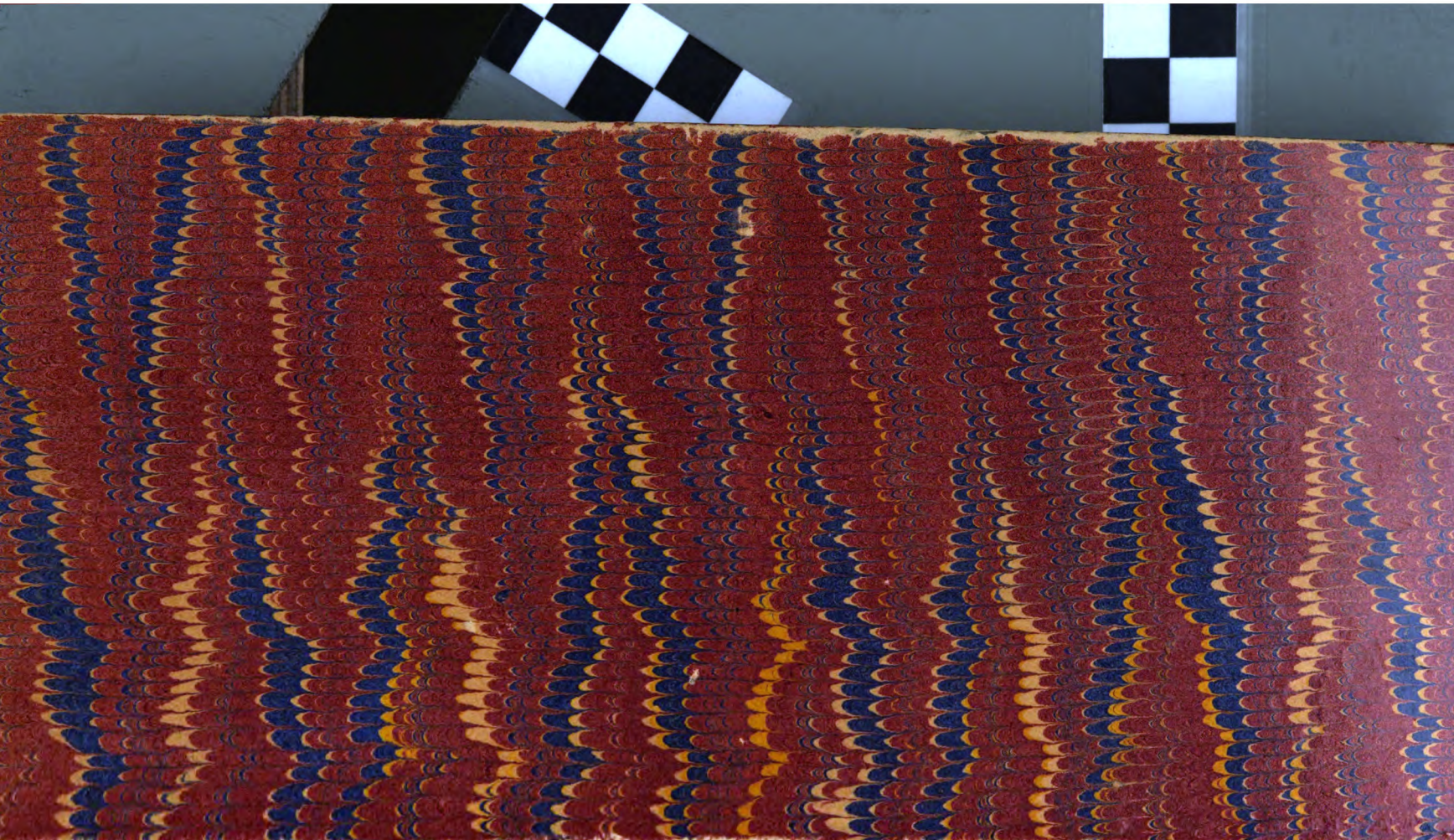

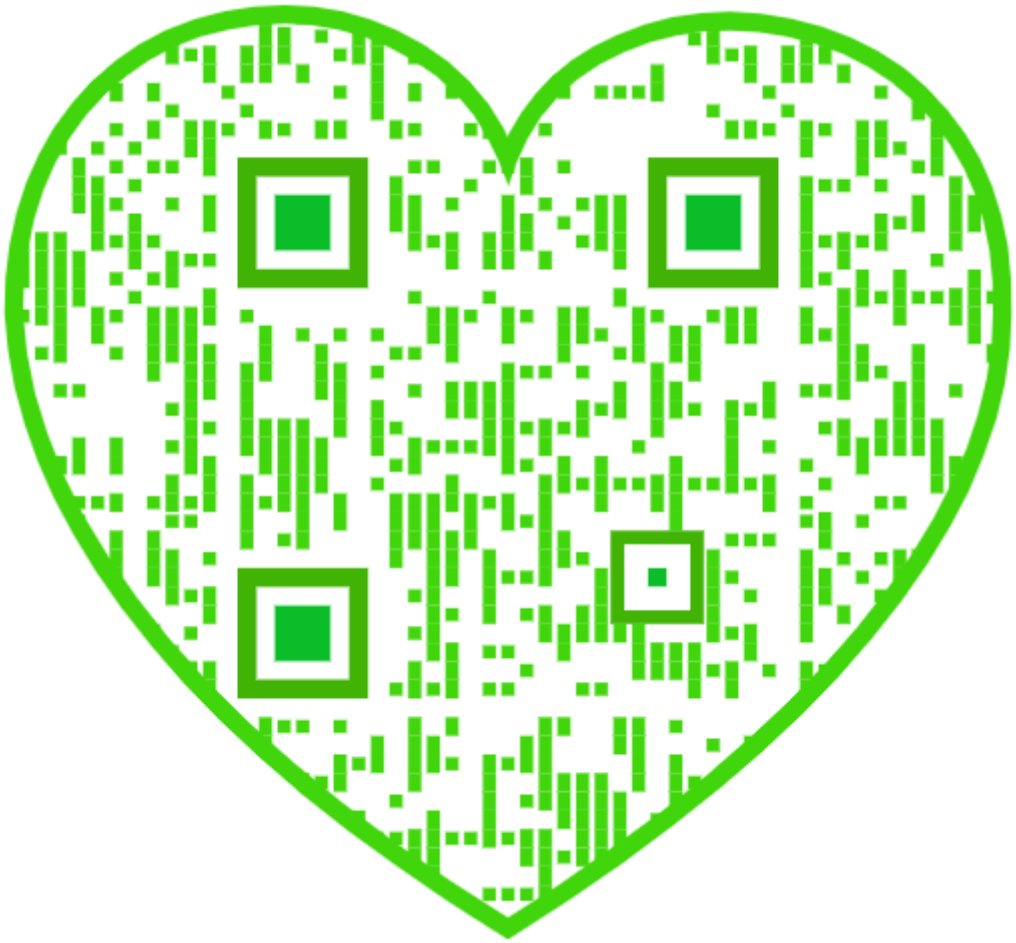

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EDITED BY

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VOLUME VI

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NOTES ON THE FLORA OF HONEY LAKE VALLEY.

By Joseph Burtt Davy.

The valley of Honey Lake is situated in the southeast corner of Lassen County, northeastern California, within a few miles of the Nevada state-line. It lies at the eastern foot of the Sierra Nevada, which forms a dividing wall between the Pacific Slope and the Great Basin, and belongs, botanically as well as topographically, to the latter region.

The Sierra Nevada, forming the south and southwest boundary of the valley, rises some 3,700 feet above the lake level, in Thompson's Peak, and presents a very steep, pine-clad front, with but little stream sculpture. The mountain chain on the north and northeast has a more gradual slope, destitute of timber, and attains its highest point at Hot Spring Peak, some 7,600 feet above the sea. The lake bed is about 4,000 feet above sea level. The floor of the valley dips slightly from all sides towards the lake,—which occupies its southwestern portion,—but has otherwise a very even, almost level surface. The valley is about fifty miles in length, east and west, and some twenty-five in width at its widest part. Though the waters of the lake now occupy an area only sixteen miles long by twelve wide, they appear to have covered the whole of the valley floor at one time, for a series of distinct shore lines is noticeable along the mountain sides. Honey Lake formerly had a channel connecting it with Pyramid Lake, which lies to the southeast, and it appears to be still connected with Eagle Lake and Horse Lake on the northeast, from verbal information obtained in the district; the large volume of clear, swift-flowing water which perennially occupies the comparatively short channel of Willow Creek, one of its tributaries, also indicates such a connection. At the present time it is a natural sink, or evaporating pan, for the waters of Susan River and other streams. It has no outlet, and in seasons of great drought dries up entirely; it was last quite dry in the summer of 1888. This year there is about fourteen feet of water in the deepest part.

Snow lies on Thompson's Peak till late in the summer; but little enters the valley, however, though a fall of about twenty-four inches has been noted.

Erythea, Vol. VI, No. 1 [3 January, 1898].

I have prepared the following synopsis of the winter temperature of the valley from data furnished by the Honey Lake Land and Water Co., and taken by Mr. L. H. Taylor, C. E. These readings were taken thrice daily, viz.: at 7 A. M., 12 M. and 7 P. M., only during the 63 days from December 25, 1890, to February 25, 1891:—

Mean temperature of the period (F.)	33°
Mean temperature of the warmest day, Feb. 22	48.3°
Mean temperature of the coldest day, Jan. 10	19.3°
Maximum temperature, Dec. 25	60°
Minimum temperature, Jan. 12	7°
Range	53°
Greatest daily variation, Dec. 25 and Jan. 9	33°
Least daily variation, Jan. 7	3°
Mean daily range of temperature	19.6°
Mean lowest temperature of the period	24.4°
Mean highest temperature of the period	44.1°

The valley floor consists of a deep deposit of alluvial soil of a light yellowish color, largely charged with salts, of which sodium carbonate apparently forms a very considerable proportion. As in other parts of California, the "alkali" salts are not uniformly distributed through the soil, but occur in patches, often of large extent, and sometimes, but by no means always, effloresceing at the surface. A "hardpan" of concentrated salts occurs, usually between 2 and 3 feet below the surface, especially where Greasewood, *Sarcobatus vermiculatus*, grows.

The mountains to the south and southwest are granitic; those to the north and northeast form part of the great lava deposit which covers almost the whole of northeastern California. Several springs, at least eight in number, throw up hot, sulphurous water, in geyser fashion, several inches above ground, accompanied by much steam. Springs and streams of water are otherwise scarce on the north and east sides of the valley.

At the extreme west end of the lake a delta of rich, blackish, alluvial soil has been deposited by the joint waters of Susan River and Willow Creek. Its sloughs and the shallower parts of the lake abound with "tules" (*Scirpus lacustris occidentalis*), from which the delta has acquired the name of "The Tules" or "The Tule Confederacy." It is well watered from the many sloughs by which the river empties itself into the lake, and produces a flora entirely different from that of the arid north and northeast portions of the valley.

The sparse population of Honey Lake Valley, almost restricted to the western and southern portions, depends upon agriculture for its support. The principal industry is that of grazing and hay production, fine cattle and horses being raised. The sage-brush covered hills on the north and east, though apparently destitute of any nourishing vegetation, furnish spring and autumn pasturage to many thousand head of cattle, horses and sheep. In summer the stock are driven into the higher pine-clad mountains around Eagle and Horse Lakes, where native grasses are said to grow in greater abundance. In winter they are corralled and fattened on "wild hay," cut from the "wild meadows" of the Tule Confederacy in the summer. Excellent apples, pears, plums, gooseberries and other small fruits are also produced, and on the west side, where the Sierra affords shelter from cold winds and provides numerous springs and small streams, peaches are grown to some extent.

Presumably the whole region for many miles north and east of Honey Lake Valley is similar to it as regards topography, geology and botany. Mr. Marcus E. Jones, of Salt Lake City, Utah, who recently crossed the divide north of Susanville, to Horse Lake, writes that "Horse Lake Valley is a duplicate of the region about Honey Lake." It has an elevation about 1,000 feet greater than the latter.

A brief reconnoissance of the summer flora of this interesting alkali region, was made by the writer, under directions from the Department of Agriculture of the University of California, between June 17 and 24 of this year. Only about 300 specimens were collected, it being impossible in the limited time and with the facilities at hand, to make specimens of every species seen, especially as the showery weather prevented rapid drying. Two and a half days were spent at Amedee, the railroad terminus, near the hot springs on the north side of the valley. The balance of the time was devoted to the Tule Confederacy, some ten miles west of Amedee, including most of the valley lying west of the lake, to within 11 miles of Susanville. Time would not allow a visit to the interesting slopes of the Sierra Nevada, south of the lake.

FLORA OF THE VALLEY FLOOR.

The floor of the valley is covered with a growth of more or less gray-colored spiny shrubs, varying from two to four, and in

some places even to six feet, in height. Between them the ground is mostly bare, except that here and there a tuft of grass finds protection in the base of a bush, from voracious sheep and Jack-rabbits; there were indications, also, of the presence of an ephemeral spring flora. But few species of herbaceous perennial plants occur. Not a tree or bush is to be seen over the whole valley, except at the extreme west end of the lake, where a few Lombardy poplars have been planted around ranch-houses, and where willows occasionally skirt the sloughs. The mountains to the north are likewise bare of trees, and are clothed with the same apparently endless garment of Gray Sage, *Artemisia tridentata*, and its associate shrubs, which prevails over the whole western portion of the Great Basin; the only taller plants are a few bushes of *Juniperus Californica*, from five to ten feet high, scattered here and there. The vegetation of the valley produces a general effect of weird gray monotony, and the projecting masses of brown lava on the hillsides add to the bleak loneliness of the scene. The only relief to the eye, from the general grayness, is obtained from the vivid green of the greasewood, the verdant patches of Salt Grass, *Distichlis spicata*, the columns of steam rising from the hot springs, and the view on the south of the steep northern slope of the Sierra Nevada, snow-capped, and clothed with an extensive but not dense forest. This forest is composed of Yellow Pine, probably *Pinus Jeffreyi*, with some *Pinus ponderosa scopulorum*, among which occur both Red Fir, probably *Abies magnifica*, and what is locally called White Fir, *A. concolor Lowiana*(?)

THE ALKALI SOILS.

Comparing the flora of the alkali soils in the Honey Lake Valley, at an altitude of 4,000 feet, with those in the Upper San Joaquin, only 400 feet above sea level, one is struck by the absence of certain common species of the latter region. In the Honey Lake Valley we failed to find any *Frankenia*, *Allenrolfea*, *Kochia Californica*, *Sporobolus airoides*, *Sporobolus asperifolius*, *Salicornia*, or *Bigelovia veneta*, while in their stead there were *Sarcobatus vermiculatus*, *Kochia Americana*, *Triglochin concinna*, *Elymus triticoides*, *Bigelovia graveolens*, the allied "*Chrysocoma nauseosa*," an annual *Suaeda*, and *Iva axillaris*, none of which, unless it be the last named, appear to occur in the Upper San Joaquin.

The absence of *Allenrolfea occidentalis*, the so-called "Greasewood" of wet alkali soils in the San Joaquin, and here replaced by true Greasewood, *Sarcobatus*, is of interest. It can not be caused by difference in altitude, for Mr. Jones finds it at an elevation of nearly 6,000 feet in eastern Nevada; nor does it seem that the relative moisture of soil is the affecting cause, for there are moist places in the Tule Confederacy and on the north shore of Honey Lake, where *Sarcobatus* grows luxuriantly, but no *Allenrolfea* is found. It seems probable that differences in the chemical composition of the soil may account for the relative distribution of these two plants, and an effort will be made to determine this point, by analysis, at a later date.

Mr. Jones informs me that *Sarcobatus vermiculatus* grows at an altitude of 5,000 feet in Sierra Valley, and up to 8,000 feet in Utah, "at any elevation where soil is a little alkaline." It is not recorded, as far as I am aware, from west of the Sierra. Superficially, it would appear that *Sarcobatus* grows both in alkali and alkali-free soils, provided the physical conditions are the same; Professor Hilgard has proven, however, that where no efflorescence occurs, the roots of this shrub descend until they reach the alkali hard-pan; in one instance, he reports, the roots were traced to a depth of four feet without nearly reaching their tips. The opinion that this plant always indicates the presence of alkali is shared by the inhabitants of the valley, who say that wherever "Greasewood" is found exclusively one may know that the soil is worthless for agricultural purposes. The abruptness with which the *Sarcobatus* belt ends, as one ascends from the lake-shore to the foothills, and that of *Atriplex confertifolia* begins, is more marked than is usual in zones or belts of vegetation, but whether this is due to the chemical or to the physical conditions of the soil, or to both combined, is not clear at present.

Sarcobatus is the prevalent plant over fully 25,000 acres of this valley, occupying the lowest alkali soils adjacent to the lake.

Atriplex confertifolia forms the succeeding belt of vegetation to that of *Sarcobatus*, in passing from the lake shore to the higher and the less alkaline soils. It here forms a bush about two feet high, and often occupies large areas almost exclusively. From the slope of the hills its presence can be instantly detected by its color, which

is greener than that of Gray Sage, *Artemisia tridentata*, and more gray than Greasewood, *Sarcobatus*. It is found among the lava, much higher up on the hillsides than is *Sarcobatus*, and not infrequently a circular patch, several yards in diameter, is seen in the *Sarcobatus* belt. This is probably the plant known as Gray-green Sage in some districts.

Kochia Californica, which is but sparingly represented in the Upper San Joaquin, though abundant across the Tehachapi, in the Antelope Valley, Kern County, at an altitude of 2,500 feet, is represented by *K. Americana* in the Honey Lake Valley. The latter species does not appear to occur west of the Sierra. It sometimes grows among the Sarcobatus, at others, in patches free from other vegetation, apparently indicating that a certain percentage of salts is especially favorable to its growth.

Suaeda Torreyana is to be found commonly in the Sarcobatus and *Atriplex confertifolia* belts, especially where some efflorescence is noticeable. Not infrequently it occurs in patches, alone, and previous investigation makes it seem probable that in such cases there is more sodium chloride and less sodium carbonate present, than in the surrounding soil.

The entire absence of *Frankenia grandifolia campestris* and *Sporobolus airoides* from the Honey Lake Valley is one of the striking features of its vegetation in comparison with that of the San Joaquin. The *Synoptical Flora* mentions the former plant as occurring on the plains near San Jacinto, southern California, and in southern Nevada, and why it should not occur here, also, is not clear, unless it is owing to excess of sodium carbonate. *Sporobolus airoides*, so common in the San Joaquin Valley, and occurring in Southern Utah and as far east as Kansas and Nebraska, appears to be another "alkali weed" intolerant of strong sodium carbonate.

The general absence of Madioid Compositæ is very noticeable. Not a Tarweed (Madia or Hemizonia) was to be seen, and the only representative of the group met with was *Layia glandulosa*, which, however, is quite common on the sandy alkali-free soil along the bases of the foot-hills.

In places supplied with more water, running or stagnant, than the surrounding plain, as around the hot springs, an entirely differ-

ent vegetation from that of the drier alkali plain, occurs. Sarcobatus is less abundant and a more or less dense growth of Salt Grass, *Distichlis spicata*, affords the principal summer pasturage for numerous horses and milch cows. In this natural pasture we also find *Triglochin concinna*, *Ranunculus Cymbalaria*, *Cressa Cretica Truxillensis* here, as elsewhere, the host of *Æcidium Cressæ*, *Nitrophila occidentalis*, here more abundant than I have seen it elsewhere, *Adenostegia maritima*, *Atropis lævis*, *Deschampsia calycina*, the two latter not as abundant as in the wet adobe meadows of the Tule Confederacy, *Scirpus pungens*, *Scirpus Nevadensis* and species of Juncus.

Mr. Jones informs me that my *Triglochin concinna* (*Erythea* iii, 117, July 1, 1895) is the same as his *T. maritima debilis* (Proc. Calif. Acad. Ser. 2, v, 722, October 3, 1895) and the *T. palustris* of Dr. S. Watson (in Bot. King). It was first described from the salt-marshes of San Francisco Bay at West Berkeley, and Newark, Alameda County, where it grows along with *T. maritima*. It was also collected by Mr. Jones at Johnson, Utah, at an altitude of 5,000 feet, on May 23, 1894, and by me on the margin of Dry Lake, near Rosamond, Kern County, in 1896. It is here quite common and is frequently the host of a pretty Uredine. Mr. Jones remarks (*ibid.*) that this plant "grows on clayey, alkaline flats at Johnson, Utah, where no other plant will grow."

Triglochin maritima grows luxuriantly in the marshes of a delta formed by streamlets running down from the hot springs. It is usually in company with species of Juncus, Scirpus and Eleocharis, where the ground is too wet for Salt Grass.

Along the banks of the yet steaming streamlets, and only there, so far as our search revealed, grew a fringe of *Polypogon Monspeliensis*, *Panicum capillare*, a Mimulus, and *Erigeron Canadensis* in dwarf form.

On a ridge of blown sand beside the lake, and in several saline spots in the Tule Confederacy, an annual Suæda occurs which is often absolutely strict in habit, though sometimes branched from the base. It was not in fruit nor even in flower at the time these observations were made.

Passing from the alkali soils at the lake-shore level, upwards to he gravelly tracts which either overlie, or occur at the margin of,

the alluvial soils, and to the talus of volcanic débris, one finds an interesting change in the flora. As before noticed *Sarcobatus vermiculatus* is the prevalent plant on the alkaline alluvium near the lake, and for several miles distant from it, and is succeeded by *Atriplex confertifolia*; among these are found occasional plants of *Elymus condensatus* and *E. Sitanion*. *Suæda Torreyana* and *Kochia Americana* occur in exclusive patches, or as scattered individuals, among both the Sarcobatus and Atriplex. Still ascending slightly, and the soil becoming more gritty and less alkaline, *Grayia spinosa* is seen among the Atriplex, and then *Tetradymia spinosa* and *T. glabrata* become more abundant, these three plants giving character to the vegetation. Before *Atriplex confertifolia* is left entirely, *Artemisia spinescens*, *Eurotia lanata*, *Eriocoma membranacea* and *Bigelovia graveolens*, with some *B. Douglasii*, are met with. Even here, in efflorescing alkali spots, the above-named plants give place to Sarcobatus and *Kochia Americana*. On the sandy ridges, a little farther up (but yet not far above the lake), the Gray Sage (*Artemisia tridentata* and *A. trifida*) commences, and associated with it are found *Grayia spinosa*, the two Tetradymias before named, *T. canescens inermis*, *Argemone hispida*, an Œnothera (probably *Œ. trichocalyx*), an Abronia, *Purshia tridentata*, *Prunus Andersonii*, *Ephedra Nevadensis*, *Atriplex canescens*, *Astragalus Gibbsii* and numerous other herbaceous perennials. These plants also form the principal vegetation of the lower slopes of the lava hills.

Grayia spinosa is known as Rabbit Brush, and is probably the plant known as Buckwheat Sage in some localities of this region. Both here and in Antelope Valley, Kern County, it is much valued for winter pasture for cattle and sheep, in spite of its spiny habit. Cows seem especially partial to the fruits.

Eurotia lanata is known as White Sage and farther east as Winter Fat, and is much valued by cattle- and sheep-men for winter feed.

Prunus Andersonii, locally called Wild Peach or Spiny Peach, is very common, and was in fruit on June 19. It here forms a shrub 2–2½ feet high.

Bigelovia graveolens is sometimes called Green Sage. Mr. Jones states that he considers the *Chrysocoma nauseosa* of Nuttall, treated

as identical with this plant by Gray,* to be a good species; he adds that *C. nauseosa* occurs only on alkali spots, while *B. graveolens* is confined to non-alkali soils. My observations lead me to think that the latter rule is not invariable. In some localities the name Rabbit Brush is given to these Bigelovias instead of to the Grayia.

The absence of *Salazaria Mexicana*, so commonly met with on the edge of the Mojave Desert, is noteworthy.

Eriocoma membranacea, also occurring in adjacent Nevada, and in the Antelope Valley, Kern County, is widely distributed over the region, and is much valued as a fodder grass. It is known as Sand Bunch Grass among cattlemen. It frequently occurs among the Sagebrush on the lava hills. The rare *E. Webberi*, occurring near Reno, Nevada, was not met with. *Stipa comosa* and one or two other species of the genus are not infrequently found among the brush.

FLORA OF THE TULE CONFEDERACY.

These alluvial delta lands are flooded in the winter, and the grasses, rushes, and sedges, which form the largest part of their flora, are cut for "wild hay," which sells at the present time for about $3.00 or $3.50 per ton.

After once examining carefully one of these meadows, one obtains a good general idea of this delta flora, and but few additional plants are discovered in a walk of many miles.

The most abundant grass is "Red Top," *Atropis lævis*, which is much valued for hay, and next in abundance is the Wire Grass, a species of Eleocharis near *E. Acicularis*, which is said to "put flesh on a beef wonderful quick," in spite of its appearing to contain little or no nutriment. Horses eat it, when cut and green-dried, with as much apparent relish as if it were alfalfa. Tickle Grass, or June Grass, *Deschampsia calycina*, is common, but is not valued, as it ripens and sheds its seeds before the other grasses are ready to cut. *Hordeum jubatum*, introduced here and already fairly abundant, is the plant known as Tickle Grass, in adjoining parts of Nevada. Other common and important constituents of the wild hay are: *Trifolium spinulosum*, here growing erect, branchless, one and a half to two feet high, valued as adding much nutriment

*In Bot. Calif. i. 317.

to the hay; *T. cyathiferum*, which is less common than the preceding; *Elymus triticoides*, also known as Red Top, and entirely distinct from *E. condensatus*, which also occurs abundantly;† *Eleocharis palustris* (Water Grass), and species of Juncus. These are the most abundant plants in the meadows. The following species also commonly occur, and are widely distributed throughout the region, though the individual plants of each are not as abundant:

Polygonum Muhlenbergii, plentiful in the shallows of Honey Lake, and in meadows and pastures. It is called Sour Dock, and is much disliked by farmers, on account of the rapidity with which it spreads and the fact that horses and cattle will not eat it; sheep seem to be the only domestic animals that will crop it, but they are not raised in the Tule Confederacy at present; there is some talk of introducing them as weed exterminators. This plant forms a large part of the "tule hay," a hay of little value, save for bedding purposes.

Rumex occidentalis is occasionally met with in the meadows.

Beckmannia erucæformis uniflorus, Water Grass, is common in wet places and along the borders of sloughs; it is locally known as Wild Millet, and is valued as one of the best fodder grasses. In the state of Washington it has been found to grow in the strongest wet-alkali bogs.

Bolelia pulchella forms large masses of bright blue color in wet places and shallows of the sloughs.

Zygadenus venenosus was found sparingly in a wet meadow on Byer's ranch. *Z. paniculatus* occurs plentifully among sagebrush on the south side of the valley, west of Datura post-office, and probably elsewhere. Both species are reported to be exceedingly poisonous to sheep, in California, and, at least one of them, in Montana. Complaint has recently been made of milch cows dying from poisoning early in the season, on one of the ranches in the Tule Confederacy, but the residents are uncertain to what plant to attribute the injury; an early-flowering *Delphinium*(?), which I was too late to see, and *Bolelia* have been considered the cause, it is more probably due, however, to eating Zygadenus.

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† The popular idea is that constant mowing year after year causes *Elymus condensatus*, to degenerate into *E. triticoides*, but I was able to prove to my entire satisfaction that there are clear specific differences between the two.

The slow-flowing sloughs of Susan River vary from four to ten feet in width, and are in only a few places quite deep. The banks often produce dense growths of *Salix sessilifolia*, with some *S. longifolia*, *Rosa Californica ultramontana*, with very brilliant flowers and *Ribes tenuiflorum*, which produces fruits varying from yellow or bright red to almost black;* these fruits have rather tough skins, but a pleasantly acid flavor, and are much used by the Pah'yute Indians and white settlers, the latter making jelly from them. The deeper pools are the home of *Nuphar polysepalum*, with bright yellow flowers sometimes five inches in diameter, and leaves often fully twelve inches long, and either floating or erect. The normal growth of the sloughs consists of dense masses of Tules (*Scirpus lacustris occidentalis*), Bur Reed (*Sparganium*), and Cat Tail (*Typha*), while in the shallower places one finds *Alisma*, *Damasonium Californicum*, with prettily-fringed petals, *Bolelia*, Arrowhead (*Sagittaria*), Duck Weed (*Lemna*), *Zannichellia*, *Hippuris*, *Ceratophyllum*, and several species of Pond Weed (*Potamogeton*).

The shallow western end of the lake produces a luxuriant growth of water-loving plants. In the shallowest parts *Eleocharis palustris* abounds, and in about 18 inches of water one finds *Polygonum Muhlenbergii*, here usually, though not always, erect instead of floating, Utricularia, Marestail (*Hippuris*), Ceratophyllum, Chara, species of Potamogeton, and *Scirpus fluviatilis*, called Blade Grass. The latter plant appears not to have been previously recorded from the Pacific Coast states; I can find no salient points in which my specimens differ from the descriptions of *S. fluviatilis*, or from specimens from Minnesota; I am indebted to Dr. Brainerd for pointing out its probable affinities. Beyond this depth of 18 inches there is a broad fringe of Tules across the end of the lake. A popular local fallacy exists that an increase of water causes Blade Grass to develop into Tules.

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*According to Lindley "there are two varieties, the one bearing black, and the other yellow, fruit; the former changes from yellow to red, and finally acquires a deep blackish purple hue; the latter always retains its yellow color." The bushes I saw bore only yellow and red fruits, but I saw black fruits gathered from the banks of Susan River, and have had the same form sent from Washington State.

SHORT ARTICLES.

PICEA BREWERIANA.—A new locality for Brewer's Spruce is reported by Mr. F. W. Anderson on an unnamed but conspicuous peak on the head-waters of Elk Creek, and about two or three miles west of Marble Mountain, Siskiyou County. The trees occupied about one square mile of the steep northern slope of the peak.—W. L. J.

PLANTS FROM MONTEREY COUNTY.—Mr. Arthur L. Bolton has brought specimens of *Libocedrus decurrens*, the Incense Cedar, and of *Sequoia sempervirens*, from the Sur River, Monterey County, where he collected them last August. Mr. Bolton also brought specimens of *Diplacus glutinosus* Nutt. and *D. longiflorus* Nutt. from the same locality. Both species occurred commonly, and were so clearly distinct that they appealed to the untrained eye as being separate species. As far as I am aware, *D. longiflorus* has not previously been recorded from north of Santa Barbara.—J. BURTT DAVY.

CORRECTION.—In vol. IV, p. 185, of this journal, I mentioned *Lotus crassifolius* as one of the distinctive plants of the Redwood Region. Its inclusion in that list was unintentional and not noted until some weeks after the article had been in print.—W. C. BLASDALE.

A NEW SPECIES OF RUMEX FROM COLORADO.

By Geo. E. Osterhout.

From all the information I can gather I judge that I have an undescribed species of Rumex from the higher mountains of northern Colorado, a description of which is here given.

Rumex densiflorus. Perennial, glabrous; stem erect, not branched, grooved, ½ to 1 m. high from a stout rootstock and bearing several leaves. The lower and root leaves are on long petioles, cordate at base, some of them large, from 10 to 15 c. m. wide and from 1½ to 3 d. m. long, usually rounded at the apex, but occasionally tapering and pointed, the veins radiating at an angle of 70 deg. to 80 deg. from the midrib; the upper leaves are smaller, ovate to oblong on shorter petioles. The dense clusters of flowers are polygamous or dioecious terminating the stem, and on branches from the axils of the upper leaves; the calyx is often red and the anthers brown, giving a reddish brown appearance to the inflorescense.

The fruit is tinged with red, the calyx wings broadly ovate about 5 m. m. wide by 6 m. m. long, not grain-bearing, reticulate veining and without a noticeable midnerve, their edges slightly toothed or entire; the pedicels 1 to 1½ times the length of the calyx wings. The achene is ovate, pointed, dark-ash colored, 2 m. m. wide by 3 m. m. long.

It is possible that this species has been joined with *R. occidentalis* Watson and some of the differences may be here noticed. *R. occidentalis* has a vertical root; this species has a strong root-stock—in the specimen which I have it is seemingly horizontal—, and the plants are found in clusters. The calyx-wings of the fruit are without the distinct midnerve of *R. occidentalis*, and the achene is ovate, not oblong, and lighter in color than that of *R. occidentalis*.

I noticed *R. densiflorus* the past summer at and near

timber-line along a tributary of Grand Lake, along a tributary of the upper Laramie river, and in North Park.

A specimen of the species here described has been placed in the Herbarium of the University of California.

FERNS OF THE YOSEMITE AND THE NEIGHBORING SIERRAS.

By Alice Eastwood.

A recent gift to the Herbarium of the California Academy of Sciences, from Miss Cosy Hutchings, of a collection of ferns from the Yosemite Valley, has drawn my attention to the incompleteness of the list published by Mr. Burnham in the *Plant World*, i, 8. To permit such a list to pass without drawing attention to the omissions would mislead many.

Mr. Burnham thinks that Mrs. Lemmon's list, published in Hutching's "In the Heart of the Sierras" is probably too full. This collection of Miss Hutching's to some extent verifies Mrs. Lemmon's list. The three lists are as follows:

Miss Hutching's Collection.

1. Pellaea Bridgesii.
2. " Breweri.
3. " andromedæfolia.
4. " Ornithopus.
5. " densa.
6. Cheilanthes gracillima.
7. " myriophylla.
8. " Californica.
9. " Cooperae.
10. Cystopteris fragilis.
11. Aspidium munitum var. nudatum.
12. Aspidium rigidum var. argutum.
13. Adiantum pedatum.
14. " emarginatum.
15. " Capillus-veneris.
16. Woodsia scopulina.
17. " Oregana.
18. Polypodium vulgare.
19. Cryptogramme acrostichoides.
20. Gymnogramme triangularis.
21. " " var.

LIST OF MR. BURNHAM.

1. Pellaea Bridgesii.
2. " andromedaefolia.
3. " Ornithopus.
4. " densa.
5. Cheilanthes Clevelandi.
6. " gracillima.
7. Woodwardia radicans.
8. Pteris aquilina var. lanuginosa.
9. Cystopteris fragilis.
10. Dryopteris munita nudata.
11. " rigida arguta.
12. Adiantum pedatum.
13. Asplenium Filix-fœmina.

LIST OF MRS. LEMMON.

1. Pellaea Breweri.
2. " Bridgesii.
3. " andromedaefolia.
4. " Ornithopus.
5. " densa.
6. " Wrightiana.
7. " brachyptera.
8. Cheilanthes Californica.
9. " gracillima.
10. " myriophylla.
11. Woodwardia radicans.
12. Pteris aquilina var. lanuginosa.
13. Cystopteris fragilis.
14. Aspidium munitum.
15. " var. imbricans.
16. " rigidum var. argutum.
17. Aspidium aculeatum.
18. " " var. scopulorum.
19. Adiantum pedatum.
20. " emarginatum.
21. " Capillus-veneris.
22. Asplenium Filix-fœmina.
23. Woodsia Oregana.
24. " scopulina.
25. Polypodium vulgare.
26. " Californicum.
27. Phegopteris alpestris.
28. Botrychium simplex.
29. " ternatum Australe.
30. " Virginianum.
31. Ophioglossum vulgatum.

Mrs. Lemmon's Nos. 6 and 7 are perhaps forms of *P. Ornithopus* while Mr. Burnham's No. 5 is probably *C. myriophylla.* Miss Hutching's adds *Cryptogramme acrostichoides*, *Cheilanthes Cooperae* and *Gymnogramme triangularis.* The last is represented in two forms, No. 20, the common one known as "Gold Back," and No. 21 which is called "Silver Back." This last certainly deserves a botanical name as well as its distinct common name. *Cheilanthes Cooperae* did not come from the valley itself but from the hills lower down.

Mr. Congdon in Zoe, iii, 325 gives the following from Yosemite Cliff: *Cheilanthes Californica; Pellaea Breweri; P. densa; P. Bridgesii;* and *Cryptogramme acrostichoides.* He also adds *Aspidium Nevadense* without giving exact locality. This is probably an error since it seems to be limited to the northern Sierras.

REVIEWS AND CRITICISMS.

Elements of Botany. By J. Y. BERGEN, Pacific Coast Edition, Flora by Alice Eastwood, 1897. [Ginn & Co., Boston.)

Bergen's Botany has recently become so well-known as a successful high-school text-book and has been so frequently reviewed that Part I (devoted to morphology and physiology) may be passed over and only Part II (which is systematic) need, at this time, claim our attention. In the Pacific Coast edition of recent issue, the "Flora of the Pacific Coast" replaces the "Key and Flora to the Spring-blooming plants of the Northern and Middle States" in the Eastern edition. In a territory so extended as California, Oregon and Washington not even all the very common plants could be described in a school book of this character and merely "those most widely distributed or the most abundant near large centres of population" have been included. Although the number of species with almost equal claims is very large the choice among them has been very wisely made; as to disputed species only one or two have been included.

A brief flora, restricted in this manner to the very common native plants but with full descriptions, has long been desired by many teachers and this book Miss Eastwood has provided. Common names, which are frequently of so much assistance to the youthful novice, are made much of, but surely many will protest when they see the popular name of the Eastern *Linaria vulgaris*, i. e. Butter and Eggs, transferred to our gregarious *Orthocarpus erianthus*. Furthermore *Linaria vulgaris* is lately introduced with us. We have also to note that "High Sierras" should replace the expression "Upper Sierras," the former term enjoying acceptance with mountaineers and geographers, and that Behr's Flora of the vicinity of San Francisco is misquoted—but lapses and misprints are few.—W. L. J.

Exercises in Botany for the Pacific States. By VOLNEY

RATTAN, Teacher of Botany in the California State Normal School. [The Whitaker & Ray Co., San Francisco, 1897.]

This book of one hundred and twenty pages is the first elementary text of the kind designed especially for the Pacific Coast and is a modified extension of the "Introductory Lessons in Structural Botany" which prefaced the various editions of the author's "Popular Californian Flora." The figures have been increased in number and all, save one, are from original drawings. The illustrative material is very largely derived from indigenous species, and a considerable number of new facts, particularly concerning seedlings of Californian plants are, for the first time, described and illustrated. The curious germination of Marah or Big Root is quite fully discussed. As is well known the caulicle and plumule are buried four or five inches deep by means of the united petioles of the cotyledons, which elongate. Root-hairs are often abundantly produced at the summit of the united petioles and there attach themselves to the surface crust; this is said to aid the vertical penetration of the caulicle and it is an interesting fact, although not so very clearly stated, that the seed will germinate successfully even if lying on the surface of the ground. The germination of *Convolvulus subacaulis*, which is similar to that of *Delphinium cardinalis*, is also illustrated, as is the behavior of *Paeonia Brownii*.

As a record of some original observations the book appeals to us as being more successful than viewed as a school book, yet on the first account alone it is worthy of place in our school libraries.—W. L. J.

SHORT ARTICLES.

INTRODUCED PLANTS IN CALAVERAS CO., CALIF.—The following notes were made on a walking trip from Milton to the Calaveras Sequoia-grove, and back to Valley Springs, between May 18th and 30th, 1895.

Erodium Botrys occurs beside the stage-road between Milton and Salt Spring Valley, together with *Melilotus*

Indica, Medicago denticulata, M. apiculata, M. saliva, Silene Gallica, Marrubium vulgare, and a *Briza* which was probably *B. minor*, and grew in great abundance. *Marrubium vulgare* was also seen in two places between Copperopolis and Poole's, on the road to Angel's Camp. *Sisymbrium officinale* occurs on the roadside at Poole's, together with *Achillea Millefolium;* the latter, however, is evidently indigenous throughout middle California. *Briza minor* is very plentiful and thoroughly naturalized around cultivated and grazed lands. *Alchemilla arvensis, Centaurea Melitensis* and *Silene Gallica* occur at Poole's, near the junction of the roads from Copperopolis and from Milton, to Angel's Camp. The latter also grows high up in the hills behind Copperopolis.

At Angel's Camp, *Conium maculatum* ("Hemlock"), has become established, as also between that and Nassau, which is the "Elkhorn Station" of some maps. *Capriola Dactylon,* "Bermuda Grass" is naturalized beside the river on moist sand banks. *Trifolium pratense* is quite abundant in meadows and on adjoining hillsides, as is also *T. repens.*

Around Murphy's Camp I found *Plantago lanceolata, Silybum Marianum, Trifolium pratense, T. repens, Medicago lupulina, M. sativa, Silene Gallica, Anagallis arvensis. Rumex Acetosella* and *Lythrum Hyssopifolium.*—J. BURTT DAVY.

NOTES ON RUPPIA:—On September 19 last, I had the pleasure of finding *Ruppia maritima* Linn. in full flower. It grew in shallow ditches and isolated pools of the salt-marshes bordering Petaluma Creek, within a few miles of the town of Petaluma, California, where the water was but two or three inches deep, and there was but little current. This appears to be the first time the plant has been recorded for the tidal waters of San Francisco Bay.

Britton & Brown give the flowering period of *Ruppia maritima* in the Eastern States, as July and August. In England its flowering period is July to September, according to Hooker.

In May, 1892, Mr. A. J. McClatchie collected a Ruppia (No. 42) in fruit in a salt lake near Elsinore, Riverside Co., Calif. His plant is remarkably slender in habit and this fact, together with its early flowering may indicate varietal distinction. It has not the long sheathes of *R. occidentalis*, Wats.

A Ruppia collected in fruit by Mr. C. V. Piper, at Seattle, Wash., June 20, 1889 (No. 763), appears to be referable to *R. rostellata* Koch, var. *nana* Syme, though I have not been able to compare it with specimens of that plant.—J. BURTT DAVY.

NEWS NOTES AND CURRENT COMMENT.

THE weekly magazine, *Garden and Forest*, the choicest publication of its class, suspended publication with the completion of the tenth (1897) volume. It was conducted by Prof. C. S. Sargent and all the volumes were very rich in Pacific Coast articles. Its discontinuance will nowhere be more regretted than on this side of the continent.

DR. GEO. KING, F. R. S., Superintendent of the Royal Botanical Gardens, Calcutta, and Director of the Botanical Survey of India, has been knighted, and will henceforth be known as Sir George King.

BULLETIN No. 46, of the Oregon Experiment Station at Corvallis, is descriptive of the poisonous effects of a species of water hemlock, *Cicuta vagans*, Greene. The author, Mr. U. P. Hedrick, estimates the number of cattle killed by this plant in Oregon at about one hundred per annum. The bulletin describes and illustrates the plant with great detail, and discusses the species in all its bearings with regard to habit, distribution, the symptoms of poisoning, remedies used, and methods of eradication Closely allied plants are figured and described. No chemical investigation of the plant was made.—V. K. CHESNUT.

THE first meeting of the "Society for Plant Morphology and Physiology" was held in conjunction with the meeting of the American Society of Naturalists at Cornell University, Ithaca, New York, December 28 and 29, 1897. The officers for 1898 are: President, Prof. W. G. Farlow; Vice Presidents, Prof. J. M. MacFarlane and Prof. G. F. Atkinson; Secretary-Treasurer, W. F. Ganong.

THE most recent issues of Mr. C. G. Lloyd's "Photogravures of American Fungi" are Nos. 19 and 20, which are very creditable representations of *Lycoperdon pulcherrimum* B. & C. and *Trametes serpens* Fr.

The *Bulletin of the Torrey Club* for January appears with the name of Prof. L. M. Underwood as editor. The staff of associate editors is as follows: C. C. Curtis, B. D. Halsted, Arthur Hollick, M. A. Howe, F. E. Lloyd, Anna M. Vail.

THE daily newspapers have it that "to make a San Francisco Christmas," twenty thousand fir-trees were brought from the north Coast Ranges in Sonoma County. The "fir-trees" are *Pseudotsuga taxifolia*, Douglas Spruce, and were said to be either seedlings or young trees. The largest trees (twenty years old) sold for $3.00; the smallest seedlings for 25 cents.

THE scientific exploring vessel, Wahlberg, was wrecked on the reef of Laguna Heads, Baja California, three hundred miles south of San Diego, on the night of December 16, 1897. The crew and the scientific party aboard were all saved, and after three weeks on shore signalled a passing vessel. The Wahlberg was the property of A. W. Anthony, and sailed from San Francisco December 7th on a six months' expedition. The disaster is a serious loss to the exploration of Baja California.

A NEW OEDOGONIUM FROM CALIFORNIA.

By KARL E. HIRN, Magister Phil.

Oedogonium geniculatum Hirn, nov. spec. Oe. monoicum, oögoniis singulis paullum tumidis, oboviformibus vel oboviformi—globosis, poro superiore apertis; oösporis oögonia non complentibus, globosis vel subdepresso-globosis (et dum in sectione optica verticali plerumque subquadrangulatis); membrana oosporarum lævi, subcrassa; antheridiis 1-5-cellularibus, subepigynis, subhypogynis vel sparsis, non vero cum cellulis vegetativis alternantibus (? spermatozoidis binis, divisione horizontali ortis):

crassit.	cell. veget.	37-48 μ,	altit.	$1\frac{1}{4}$-$2\frac{3}{4}$ (-3)-plo major
"	oogon.	56-63 μ,	"	56-67 (-70) μ.
"	oospor.	48-59 μ,	"	48-59 μ.
"	cell. anth.	37-44 μ,	"	5-9 μ.

Hab. in America boreali; Berkeley, California. Legit. cl. Professor W. A. Setchell. Species hæc ex. *Oedogonio capilliformi β australi* Wittr. (Wittrock et Nordstedt, Alg. exs., Fasc. 15, Nr. 704) valde monet, est autem robustior et monoica.

Jyräskylä, Finland, 27 January, 1898.

KEY TO THE SPECIES OF PLECTRITIS AND ALIGERA.

By WILHELM N. SUKSDORF.

In a paper published in the *Deutsche Botanische Monatsschrift* (nos. 4 and 5, 1897), I ventured to separate the Pacific Coast Valerianellas (Plectritis DC.) from the other members of the Valerianaceae, being convinced that they should constitute a group or tribe by themselves. This tribe, called *Plectritideae*, was divided into two genera. Having occasion

now to add another species, I give below, at the suggestion of Mr. Willis Jepson, a very brief synopsis of the species, but leaving out the varieties and forms. The sequence of the species is nearly the same as in the paper mentioned, but subdivision is here carried a step further.

PLECTRITIS (Lindl.) DC.

Fruit winged or wingless, its ventral face broader than, or equal to one of the lateral faces, but narrower than the other; wings incurved below, less incurved or nearly erect or spreading above. Cotyledons parallel to the broadest of the lateral faces, with indistinct or invisible lateral veins when expanded.

*Corolla 4-7 mm. long, rose-color or pale, rarely white; upper lip erect; lower lip spreading.

+-Fruit winged.

P. congesta DC. Wings broad, meeting at base, wide apart above.—Lower Columbia River.

P. microptera Suksdorf. Wings very narrow, not meeting at base.—Lower Columbia River.

+- +-Fruit wingless.

P. major (F. & M.) Hock.—California (to Washington?).

* * Corolla 1.5—3 mm. long, very pale or white; upper lip spreading nearly like the lower one.

+- Fruit wingless; corolla spurred.

P. samolifolia (D C.) Hock.—Chile; Klickitat Co., Washington.

+- +-Fruit winged; corolla spurred.

P. aphanoptera (Gray) Suksdorf. Wings very narrow, not meeting at base.—Klickitat Co., Washington.

P. involuta Suksdorf. Wings broad, strongly incurved below, open above; spur 1 mm. long.—Bingen, Washington.

P. brachystemon F. & M. Not well known. Said to be

like P. congesta, except that the flowers are much smaller and white.--California.

P. magna (Greene) Suksdorf. Wings meeting below, slightly open above.—Sonoma Co., California.

+– +– +–Fruit winged; spur wanting or rudimentary.

P. anomala (Gray) Suksdorf. Wings broad, meeting at base, wide apart above.—Lower Columbia River.

ALIGERA Suksdorf.

Fruit winged, its lateral faces equal, narrower than the ventral one; wings equally incurved above and below, forming with the ventral face a dish or vessel, orbicular or oval in outline, and saucer- bowl- cup- or urn-shaped, or often resembling a breathing-pore or stoma with its cavity, the incurved part of the wings in the latter case imitating guardian cells. Cotyledons parallel to the ventral face, plainly reticulated when expanded.

*Corolla 2-lipped, red or rose-color, rarely white; upper lip erect, arched, 2-lobed or emarginate; lower lip ascending or spreading, 3-parted.

+–Corolla 2—3 mm. long; spur 2—3 mm. long.

A. macroptera Suksdorf. Disk much longer than the fertile cell, orbicular or oval, saucer- or bowl-shaped.—Washington and Oregon.

A. macrocera (T. & G.) Suksdorf. Disk cup-shaped, orbicular, shorter than the fruit.—California.

A. ciliosa (Greene) Suksdorf. Disk oval or roundish, stoma-shaped, its opening elliptical-rhombic, or roundish and larger.—California.

+– +–Corolla 1.5 mm. long; spur 1 mm. long.

A. rubens Suksdorf. Disk about as long as the fruit, orbicular, somewhat urn-shaped.—Klickitat Co., Washington.

A. insignis, Suksdorf. Disk orbicular, stoma-shaped, its aperture roundish.—Lower California.

* * Corolla white to pale rose-color; limb equally 5-lobed' spreading; spur shorter than the body, mostly much shorter.

+—Corolla 2 mm. long, lobes short, nearly semicircular.

A. Grayi Suksdorf. Disk about as long as the fruit, orbicular or nearly so, bowl-shaped.—Washington to California.

A. mamillata Suksdorf. Fruit with small wings and long beak; disk roundish or oval, stoma-shaped, its opening orbicular.—Simcoe Mts., Washington.

+ +—Corolla 4 mm. long, lobes oblong.

A. Eichleriana Suksdorf. Disk cup-shaped or somewhat urn-shaped, roundish or transversely oval, its opening broader than long.—California.

A. ostiolata Suksdorf. Disk scarcely broader than the fruit, roundish or oval, stoma-shaped, aperture orbicular, small.—California.

A. Jepsonii. Fruit hairy on the outside, also on the visible portion of the ventral face; pubescence white and fine, very dense on the back, here and on the beak 0.5 mm. long or more, shorter and less dense elsewhere; disk roundish, stoma-shaped, its aperture oblong-rhombic; incurved part of wing thickish and marked lengthwise on the outside by a groove.—Rio de los Putos Bluffs, Solano County, California, 1890, collected by Mr. Willis L. Jepson, who has sent me several interesting forms of this genus.

Bingen, Washington.

SHORT ARTICLES.

BERMUDA GRASS IN ARIZONA:—A reliable correspondent informs me that *Capriola Dactylon* (L) Ktze. has become

very abundant around Tempe in the Salt River Valley, Arizona, and that it is there very troublesome in orchards and gardens, materially injuring fruit trees by "choking." The seeds and pieces of rhizome are carried along canals and irrigation ditches, and are thus disseminated over a large area.

Johnson Grass (*Andropogon Halepense* (L) Brot.) having been introduced for fodder, is spreading through the Salt River Valley in the same way, much to the disgust of orchardists.—J. BURTT DAVY.

EARLY BLOSSOMING OF PLANTS.—In spite of the lateness of a dry season, succeeding an abnormally cold winter, a botanical party of three persons succeeded in finding seventy-six species of wild flowers in blossom on February 22, at Leona Heights, Alameda Co., Calif. The following were the most interesting:—Brodiæa capitata, Dodecatheon Hendersoni var. cruciata, Pedicularis densiflora, Viola pedunculata, Eschscholtzia crocea, Cynoglossum grande, Achillea Millefolium, Delphinium nudicaule, Calandrinia Menziesii, Saxifraga Californica, Athysanus pusillus, Pterostegia drymarioides, Claytonia spathulata, Tillaea minima, Berberis pinnata, Sidalcea malvæflora, Rhamnus crocea, Phacelia divaricata and Wyethia helenioides.—J. BURTT DAVY.

THE BOTANICAL NAME OF THE RIBBON GRASS:—Prof. Beal names this plant of our gardens as *Phalaris arundinacea* var. *picta*, in his Grasses of North America ii, 184, 1896. This varietal name is antedated by *Phalaris arundinacea* var. *variegata*, Nicholson, Dictionary of Gardening iii, 184, May 1886.—J. BURTT DAVY.

MEDICAGO MACULATA Willd.:—This plant is more abundant immediately around Fort Ross than in any one locality in which I have as yet seen it. Is it not probable that it owes its introduction to that spot, to the Russian colonists who made their home along the coast between Point Arenas, Tomales Bay and Petaluma, with headquarters at Fort Ross

from 1811 till about 1842? *Malva rotundifolia* grows along with it, and *Calendula officinalis* occurs by the roadside near cottages, having escaped from their gay little gardens.—J. BURTT DAVY.

LILY BULBS AND FLOWERS AS FOOD.—One may frequently see in the provision-dealers' stores in Chinatown, San Francisco, large baskets of yellowish-white lily bulbs, offered for sale. Enquiry elicits the information that these bulbs are eaten as a vegetable by the Chinese, after being lightly boiled. Several attempts to grow them in the Botanic Garden of the University of California, have failed, probably from lack of moisture. In March last, however, I obtained two good-sized bulbs in Chinatown, and planted them in the light soil of a shaded rockery, subject to daily watering. A plant grown from these bulbs flowered on August 21st, and proved to be the variety *Brownii* of *Lilium Japonicum*.

The bulb of *Lilium cordifolium*, known as Kiu, is made into cakes and eaten by the Ainus of Japan. The Japanese use the extracted starch in confectionery.

Mr. Inazo Nitobe reports that in Japan there never is a well-chosen menu which does not include lily-bulbs among its dainties. He adds that *L. Tigrinum* and *L. concolor* var *pulchellum* are most frequently used, with *L. Glehni* occasionally.

The dried blossoms of *Hemerocallis graminea* and *Lilium bulbiferum* are used in China to an enormous extent for flavoring soups, and as a vegetable.—J. BURTT DAVY.

NOTES ON INTRODUCED WEEDS:—The St. Barnabas Thistle, *Centaurea solstitialis*, L., has found its way into Alameda Co., Calif. On Oct. 9th last I found a number of luxuriant specimens surrounding a garden which fronts on Moss Avenue, between Piedmont and Temescal, near the Fabiola Hospital.

The Dandelion, *Taraxacum officinale* Weber, is growing plentifully by the roadside near the Requa residence, Highland Avenue, Piedmont, and also on 14th Street, Oakland.—J. BURTT DAVY.

OPEN LETTERS.

Fritillaria pluriflora Torr. in Solano County.

In going over those hills near the Sweeny Creek Gulch (which is the Sweeny Creek of Peaceful Glen Valley), and on the plains side of that hilly country, we found the first few specimens. They were nothing extra; but a little further on I found some beauties, the largest that I ever saw. Some of them surely had petals at least two inches from base to tip. As we went on we found more, but none quite so large as the others. But in the grain belt the ground was pink with thousands of their blossoms—the most in one locality that I ever saw.—R. H. PLATT.

Vacaville, California, February 23, 1898.

Fritillaria pluriflora is a rare plant occuring on the Sierran side of the Sacramento Valley: Feather River, *Fremont;* "In locis per tempus pluviorum inundatis, in valle Sacramento," *Hartweg*, No. 258, collected without doubt in Butte Co. In the Bay region the species has been obtained only in north-western Solano Co.—W. L. J.

NEWS NOTES AND CURRENT COMMENT.

MESSRS. HY. DEANE and J. H. MAIDEN have issued the second part of their "Observations on the Eucalypts of New South Wales" with illustrations by W. R. L. Baker. It appears as a reprint from the *Proceedings of the Linnean Society of New South Wales*, 1896, Part 4, Novem. 25. One new species, *E. fastigiata*, is described and figured.

THE Arnold Arboretum of Harvard University has been presented with $20,000, the income of which is to be used in scientific investigations on arboriculture.

THE FIRST Fluckiger Gold Medal, to be granted once in every five years for distinguished services in the promotion

of pharmaceutical research, has been awarded to Edward Morell Holmes, F. L. S., secretary of the Pharmaceutical Society, London, England. Mr. Holmes is well known by his pharmaco-botanical papers in the *Pharmaceutical Journal* and elsewhere, and his *Algae Britannicae Rariores Exsiccatae.*—J. BURTT DAVY.

MR. OLIVER A. FARWELL, writing in the October *Bulletin of Pharmacy* on myrrh says, "the African and Arabian myrrhs * * * are the exuded gum of a palm, the *Balsamodendron Schimperi*, and its several varieties. The 'balsam' of the Hebrews is the exudation of another palm, the *Commiphora Opobalsamum.*" As a matter of fact the Dicotyledonous genus Commiphora of which Balsamodendron is a synonym, belongs to the Burseraceae and is in no way nearly related to the Monocotyledonous Order to which the palms belong. It is misleading to apply the name palm to plants so widely different.—J. BURTT DAVY.

MR. ALFRED J. MCCLATCHIE has been appointed Professor of Agriculture and Horticulture in the University of Arizona. His present address is Phœnix, Arizona.

NEW SPECIES OF WASHINGTON PLANTS.

By C. V. Piper.

Trifolium caurinum. Perennial from tuberous (?) roots; stems solitary, simple, erect, rather slender, striate, 1–3 dm. high, glabrous below, very sparsely pubescent above with weak whitish hairs; leaves long-petioled; leaflets three, thin, oval, entire, obtuse at apex, with or without a short mucro, obtuse, usually cuneately so, at base, glabrous above, sparsely hirsute beneath, especially along the midrib, very shortly petiolate, 3 cm. or less long; veins conspicuous; stipules entire, the lower lanceolate, acute, adnate to the petiole except at the tip, the upper ovate, acute, adnate for only half their length: peduncle well exceeding the leaves; heads 2–3 cm. long, subglobose, 25–40 flowered, not involucrate; flowers whitish, on pedicels 2 mm. long, somewhat deflexed in age: calyx hirsute with white hairs, the tube oblique campanulate about 2 mm. long, 10-nerved; teeth narrowly linear, acuminate, the three anterior 3–3½ mm. long, the posterior two 2 mm. long, not longer than the tube; corolla about 10 mm. long, much exceeding the calyx, glabrous, the wing and keel petals united at base; pod stipitate, containing when immature 3–5 ovules, of which probably only one develops into a seed; style glabrous.

Big Creek Prairie, alt. 2,500 ft., Chehalis County, Washington, August 1, 1897, F. H. Lamb, 1395. A species related to *T. eriocephalum* Nutt., and *T. longipes* Nutt. but very distinct from both.

Peucedanum confusum. Stems 8–12 cm. long from a deep-seated globose tuber, which is more or less covered with clusters of rootlets: leaves all radical, once or twice ternate, the segments all more or less lobed, the final divisions linear and usually short; petioles all dilated: umbel very unequally 2–5 rayed, the rays short, in fruit 2 cm. or less long; involucels of 2–5, minute, linear, white margined bracts; flowers white with purple anthers, 10–20 in each umbellet: fruit oblong, puberulent, 6 mm. long by 3–3½ mm. wide, on short pedicels; wings nearly as broad as the body; oil tubes frequently wanting and when present minute or rudimentary;

in many cases a single oil tube is present in each lateral rib and not rarely one occurs in all the ribs; sometimes 2–3 rudimentary tubes are present in the intervals, and in very rare cases 2–6 occur on the commisural side; seed face plane.

Very common in moist rocky places on the Palouse Hills, Whitman County, Washington, blooming in April or earlier and maturing its fruit by June. The earliest spring flower in the region and locally called "Pepper and Salt," in allusion to the color of its flowers. This plant has been referred to *P. Hendersoni* C & R., *P. Watsoni* C & R., and *P. farinosum* Gey., with none of which it agrees. It is nearest *P. farinosum*, but has the puberulent fruit of *P. Watsoni*.

Aster Jessicae. Stems in large clusters, stout, erect, 1 to 1½ metres high, branched toward the summit, leafy to the top, the whole plant cinereous-pubescent, but not glandular, with short, curved hairs; leaves thickish, reticulate veined, the radical oblong, tapering to both ends, acute, entire, or rarely with one or two appressed teeth, 5–10 cm. long, on margined petioles as long or longer; cauline oblong-lanceolate, entire, acute, sessile or partly clasping (but not auriculate) by a contracted base, the larger 10–15 cm. long: panicle loose and narrow, racemose in form; heads 2–3 cm. in diameter, single or in clusters of two or three, terminating stout ascending leafy branches; involucre of about three rows of broadly lanceolate acutish scales, herbaceous or the inner scarious at base; all becoming somewhat scarious in age; not rarely some of the outer bracts become foliaceous; rays 20–50, pale violet, about 1 cm. long, 2 mm. wide: akenes scabrous hispid; pappus dirty whitish.

Along the Palouse River at Pullman, Washington, blooming in August and September. Distributed by me under No. 1604 as *Aster integrifolius* Nutt., to which it bears no resemblance. Apparently it is nearest *A. Hendersoni* Fernald.

Gilia hispida. Annual, prostrate, 5–15 cm. in diameter, hispid throughout with white hairs; stems usually purplish, branched from the base in a falsely dichotomous manner, the branches curving inward in age; leaves all alternate, spatulate-lanceolate, acutish or the earliest truly spatulate and obtuse, 10–20 mm. long, all tapering to a narrowed base; midrib prominent in age, the veins

not visible: flowers solitary and sessile in the forks or terminal, the latest ones loosely crowded in very leafy capitate clusters: calyx green, very hispid, the lobes nearly equaling the corolla, becoming scarious at base in age; corolla pinkish, tubular, 5 mm. long, the lobes very short and obtuse, very slightly dilated in the throat, sparsely hispid above both within and without; stamens unequally inserted, entirely included in the lower half of the tube: ovary 2-celled; style short, one-half the length of the corolla; mature capsule oblong, 3 mm. long with about eight ventricose swellings on each valve marking the position of the seeds; seeds 10–12, black, wrinkled, ½ mm. long, the coats not developing mucilage when wetted.

Pasco, Franklin County, Washington, in drifting sand, collected by L. F. Henderson, 2402, June 12, 1892; H. H. Hindshaw, May 25, 1896; C. V. Piper, July 11, 1897.

Vleckia occidentalis. Size and habit of *V. urticifolius;* stems glabrous below, puberulent above: leaves triangular ovate, obtuse or sometimes acute, coarsely sinuate-dentate, green and glabrous above, canescent beneath, the petioles 10–20 mm. long; lower and larger leaves 4 cm. long, gradually diminishing in size upwards: spikes thick and dense, 2–8 cm. long, 2–2½ cm. thick: calyx minutely puberulent, the subulate teeth tinged with violet; corolla, anthers, and style tips violet; pollen green.

Almost exactly intermediate between *V. fœnicula* (Pursh) and *V. urticifolius* Rafin., having the foliage of the former and the inflorescence of the latter. Specimens examined: KITTITAS COUNTY: 6 miles southwest of Ellensburg, June 28, 1897, A. D. E. Elmer, 396 (type); Wenatchee, K. Whited, 143½, June 28, 1896. YAKIMA COUNTY: Lower Natchez Valley, L. F. Henderson, June 13, 1892; mouth of Natchez River, C. V. Piper, July, 1897. DOUGLAS COUNTY: between Coulee City and Waterville, W. J. Spillman, May 27, 1896.

Stachys Emersoni. Perennial, about a meter high; stems glabrous or sparsely hispid on the faces, scabrous on the angles with retrorse, rather long and weak papillose-based hairs: leaves about six pairs, ovate, cordate or subcordate at base, obtuse, coarsely crenate, sparsely pilose pubescent on both faces, 6–7 cm. long by 4 cm. broad; petioles 2–4 cm. long, channeled above, hirsute

pubescent, dilated at base; internodes much exceeding the leaves: flowers single or in twos, the lowermost sessile in the axils of the upper leaves, the upper contracted into a leafy bracted spike; bracts lanceolate, nearly sessile, exceeding the flowers: calyx campanulate; shorter than the tube of the corolla, the teeth deltoid-acuminate, tipped with a white arista, the anterior longest, all hirsute ciliate; corolla 12 mm. long, purplish, puberulent without, especially the upper lip, glabrous or slightly bearded within; lower lip white spotted.

Collected by F. H. Lamb, 1138, along river banks, Hoquiam, Chehalis County, Washington, June 2, 1897, and dedicated at his request to Mr. G. H. Emerson. This species resembles somewhat *S. ciliatus* Dougl., but is at once distinguished by its very different flowers.

Listera caurina. Stems slender, 15–30 cm. high, glabrous below the leaves, the inflorescence glandular pubescent; leaves sessile by a clasping base, ovate, obtuse or acutish, glabrous, 3–5 cm. long; flowers 5–40, usually about 15, greenish; bracts ovate, acute, $\frac{1}{3}$ the length of the pedicel, this 5–7 mm. long; sepals and petals lanceolate, spreading not reflexed in anthesis; lip 4 mm. long, cuneate, obovate, with an inconspicuous tooth between the two shallow notches at apex, and a small tooth on each side near the base; column stout; $1\frac{1}{2}$ mm. long, incurved; capsule erect, ovoid, 5–6 cm. long.

Common in the Cascade Mountains, at about 3,000 ft. alt., in coniferous woods, Henderson, Piper; Olympic Mountains, Lamb; Cedar Mountains, Latah County, Idaho, Piper. This species has been confused with *L. convallarioides* Nutt., which may easily be distinguished by the much larger (10–12 mm. long) deeply notched lip, shorter pedicels, and by having the sepals strongly reflexed in anthesis. *L. convallarioides* is a much rarer plant in this region than *L. caurina*, but we have examples from all our mountain ranges which match exactly with eastern specimens.

BARON FERDINAND VON MUELLER.

It is something of an interesting coincidence, one which the phytologist may be pardoned for indicating, that the most able scientist of the American continent, and the greatest scientific figure of the

island continent of Australia, should have been in each case, first of all, a botanist.

A notice of Baron Mueller's life was some time since half promised for these columns. In an issue of the *Victorian Naturalist*, now more than a year old, there is published a biography of the Baron, from which we transcribe here a few of the leading facts of his life, which was one of great industry and large results.

He was born in Rostock, Germany, in 1825, and received his education at the University of Kiel, where he attended the botany lectures of Nolte. The degree of Doctor of Philosophy was conferred in 1846, and in 1847, at the advice of his physician, he emigrated to Australia.

In 1852 he was appointed Government Botanist of the colony of Victoria. "From that time onward he devoted himself with untiring, and one might almost say with phenomenal, energy to the work of the post, which was described as the investigation of the vegetable resources of the colony, though it may be said without any exaggeration whatever that, whilst Victoria had the honor of claiming him as her botanist, the other colonies shared almost equally in the advantages to be derived from his wide knowledge; he was in fact, though not in name, Government Botanist of Australia. Not only was his reputation world-wide, but, what is more remarkable, there was probably no township or hamlet in the whole of Australia, from Cape York to Hobart and from Sydney to Perth, in which the name of Baron von Mueller was not known and respected."

He was greatly interested in the geographical exploration of Australia and devoted a great amount of time to field work. "As early as 1853 he had been to the top of Mt. Buffalo, and the same year found him starting alone from Melbourne, with three horses, to explore what were then the almost untrodden wilds of Gippsland. The sight of him, as he passed through what was then the countrified suburb of Hawthorne, mounted on his favorite pony, and driving before him his pack-horses laden with his collecting material and slender allowance of food, is still vividly remembered."

Very early he began to accumulate material for a comprehensive Flora of Australia. When the time came, however, it seemed absolutely necessary that the work should be done by some Euro-

pean authority who had access to the types. Mueller's specimens and notes were on this account turned over to Bentham, who, assisted by Mueller, issued the celebrated "Flora Australiensis" in seven volumes.

The best-known of Mueller's own works are the "Eucalyptographia," "Systematic Census of Australian Plants," and "Select Extra-Tropical Plants."

Mr. James Britten, editor of the London *Journal of Botany*, in the course of a criticism of a sketch of Mueller, published in the *Gardeners' Chronicle*, says: "That he had a weakness for titles and a high opinion of his own capabilities was manifest enough, not only to his correspondents, but to those acquainted with his work; but the weakness is one to which many excellent folk are subject, and it would have been affectation had he not recognized the great work he did for Australian botany. That the Baron was capable of great sacrifices on behalf of science is manifest; the generosity with which he supplied Mr. Bentham with the material which he had accumulated for a Flora of Australia is in itself a sufficient proof of this—indeed, his willingness to communicate information was only equaled by his anxiety to acquire it."

The botanists of California have been for many years, annually, or more often, reminded of Baron Mueller's unceasing generosity by the receipt of bundles of plants and packages of choice seeds. Indeed the whole of California evidences this generosity. The long lines of lofty Eucalypti in the interior valleys, the many species of Acacia and a host of rare and beautiful Australian shrubs, now at home in all parts of the state, owe to him their first introduction. California's tribute to the memory of Baron Mueller was written by Mr. C. H. Shinn in the issue of *Garden and Forest* for September 29, 1897.

In his Presidential address to the Royal Society of New South Wales, last May, Mr. J. H. Maiden suggested that the publication of a complete list of Mueller's works, with biographic annotations, would form a very appropriate memorial of him. "The list," Mr. Maiden said, "should be in strict chronological order, with a botanically classified supplement. Such a list would find a place on the work-table of every student of Australian plants, and would go far to keep his memory green. The value of such a publication would

be greatly enhanced if there were added to it reprints of some of his papers in obscure or rare serials; at present they are lost to most of us."

Botanical workers on this shore of the Pacific would heartily welcome such a publication. It appeals to one as being the most appropriate memorial of the Baron which could be erected; and at the same time the most useful, a feature which would have appealed to him whom it is proposed to commemorate. We do not doubt that many of his correspondents would gladly subscribe to a memorial fund for this purpose, and trust that some of the learned societies of Victoria may take the matter in hand.

Since the above was written we are in receipt of a circular concerning the "Baron von Mueller National Memorial Fund," which relates that at "a public meeting held in the Town Hall of Melbourne on November 15, 1897, at which the Mayor of Melbourne presided, a committee was appointed to secure the establishment of some permanent memorial to commemorate the great services rendered by the late Baron von Mueller. . . . Not only did he spend his whole life in the furtherance of the work in which, from the nature of his position, he was most deeply interested, but he devoted practically the whole of his income to the assistance of those who were engaged in work the object of which was to increase our knowledge of the nature and products of Australian lands. The object of this committee is to secure funds to allow of the sufficient establishment of some permanent memorial which shall worthily perpetuate his name; it is hoped that sufficient funds will be forthcoming to provide for the erection of some form of statue and the endowment of a Medal, Prize, or Scholarship, to be associated with Baron Von Mueller's name and to be awarded from time to time in recognition of distinguished work in the special branches in which he was most deeply interested, and which shall be open to workers throughout the Australian colonies." Contributions to the fund may be sent to C. R. Blackett, Esq., College of Pharmacy, Melbourne, Australia.

SHORT ARTICLES.

BAKER'S MONOGRAPH OF THE LILIACEÆ.—Mr. Baker writes that the Synopsis of Aloineæ and Yuccoideæ (1880) is the last part of his monograph, issued. He adds: "The whole Order is complete except Allieæ, and these Regel has dealt with. There are a great many new species described in Flora Capensis, Vol. vi, published a short time ago, and the Tropical African species up to date are dealt with in the volume of the Flora now in the press."

There are seven parts to Mr. Baker's monograph, and these are scattered through several volumes of the Linnean Society's Journal, which renders them inaccessible to most students possessed of but small libraries. It is to be hoped Mr. Baker may see his way to issue a uniform and up-to-date monograph of the Liliaceæ, after the style of his works on the Irideæ and Amaryllideæ.

The following references to the separate parts of Mr. Baker's monograph may be of service to students of the Order; the date of presentation to the Linnean Society has been supplied as far as possible:—

i. A Revision of the Genera and Species of Herbaceous Capsular Gamophyllous Liliaceæ [including the Tribes Hemerocallideæ, Agapantheæ, Milleæ, Massonieæ, Hyacintheæ, Odontostemoneæ] Journ. Linn. Soc. (Botany), xi, 349–436. Read Feb. 3, 1870.

ii. A Revision of the Genera and Species of Scilleæ and Chlorogaleæ. Op. cit. xiii, 209–292. Read March 7, 1872.

iii. A Revision of the Genera and Species of Tulipeæ. Op. cit. xiv, 207–310. Read Dec. 4, 1873.

iv. A Revision of the Genera and Species of Asparagaceæ. Op. cit. xiv, 508–632. Read 1875.

v. A Revision of the Genera and Species of Anthericeæ and Eriospermeæ. Op. cit. xv, 253–363. Read 1877.

vi. A Synopsis of Colchicaceæ and the Aberrant Tribes of Liliaceæ [including the Tribes Boryeæ, Sowerbæeæ, Aphyllantheæ, Colchicaceæ, Merenderеæ, Anguillarieæ, Uvularieæ, Helonieæ, Veratreæ, Tofieldieæ, Conantherеæ, Liriopeæ and Gilliesieæ]. Op. cit, xvii, 405–510. Read Feb. 16, 1879.

vii. A Synopsis of Aloineæ and Yuccoideæ. Op. cit. xviii, 148–241. Read Jan. 15, 1880.

The genus Brodiæa was revised by Mr. Baker in the *Gardeners' Chronicle*, Series 3, xx, pp. 213, 241, 459, and 687, June–December, 1896.—J. BURTT DAVY.

TRICHOSTEMA LANATUM IN MONTEREY COUNTY.—Mr. Arthur L. Bolton has brought to the herbarium of the University of California, specimens of *Trichostema lanatum* Benth., which he found growing plentifully on the Sur River, some eighteen miles, in an air line, south of Monterey. The *State Survey Botany* gives the range of this species as "rocky ledges, Monterey? or Santa Barbara to San Diego County"; Gray, in the *Synoptical Flora*, omits the reference to Monterey, probably considering it as erroneous. Mr. Bolton's discovery is therefore an important one, adding fully 120 miles to the known northerly range of the species.—J. BURTT DAVY.

CYPERUS STRIGOSUS LINN.—This sedge appears to be hitherto unrecorded as occurring in California. Mr. Geo. Hansen has collected it near Jackson, Amador County, and distributed it as part of 821 in his Flora of the Sequoia Region. The determination was kindly made by Dr. Britton. Britton and Brown in their *Illustrated Flora* give the range of the species as "Maine and Ontario to Minnesota, south to Florida and Texas."—J. BURTT DAVY.

NAIAS FLEXILIS IN SAN FRANCISCO.—This species was recorded by Chamisso (in *Linnæa* iv, 502, teste K. Brandegee), as occurring "in ponds near San Francisco;" since then there appears to be no note of its occurrence in the county. On August 21 last, Mr. A. A. Lawson and I went to Mountain Lake to see whether it might not be found there, and were fortunate enough to go straight to the only spot where it appears to grow. There seems to be but little of it, though time did not permit us to search all round the lake.—J. BURTT DAVY.

POPULAR PLANT NAMES.—*Calochortus albus* is known as "Bell-flowers" by children in Calaveras County, California: in Berkeley it is known as "Fairy Bells," and "Hair Bells." In the neighborhood of Berkeley, California, the following names are commonly heard: "Beggar's Lice" (*Galium* spp.): "Bridal Wreath" (*Neillia opulifolia*): "Arrow Wood" (*Holodiscus* spp.): "Dandelion" (*Agoseris* spp.): "Deer Tongue" and "Mosquito Bill" (*Dodecatheon* spp.):

"Wild Flag Lily" (*Iris* spp.): "Ladies' Chewing Tobacco" (*Fœniculum vulgare*); the buds and very young leaves have for many yearst been prized by California school-children, who chew them as Swee-Flag is chewed by eastern children: "Maiden's Tear" (*Pellæa andromedæfolia*): "Pin Bloom" (*Sanicula bipinnatifida*): "Star Flower" (*Trientalis*).—J. BURTT DAVY.

OPEN LETTERS.

Larrea Mexicana North of the Tehachapai Mountains.—I send you under another cover some branches of a solitary bush [*Larrea Mexicana*, Moricand] that grows out on the Tulare Plains. I believe that it may contain some medicinal properties. . . . It is called "Dead man's bush" from the fact that a man was found dead near it twelve or fifteen years ago. I believe that the seed may have been in his pocket and grown the year after he died, or he may have been poisoned by eating some of its leaves. Anyway his remains were found torn to pieces by the coyotes, long after his decease. Yours respectfully, A. A. STILL.

Annette, Kern County, California,
February 7, 1898.

NEWS NOTES AND CURRENT COMMENT.

A REVISION of Lilæopsis (Crantzia), by J. M. Coulter and J. N. Rose, appeared in the *Botanical Gazette* for July, 1897. The fruit and section of the fruit of the four species of the genus are figured; *L. occidentalis* from Oregon and Washington being described as new.

THE eighth annual report of the Missouri Botanical Garden is largely devoted to insular botany. It contains the following scientific papers: "The Mosses of the Azores" and "Mosses Collected in Madeira, by William Trelease in June, 1896," by J. Cardot; and "Botanical Observations on the Azores," by William Trelease.

THE degree of Master of Arts has been conferred by Harvard University upon Mr. C. E. Faxon, for his attainments in science

and art. Mr. Faxon is well known to botanists on account of his plant illustrations in *Garden and Forest*, and in Sargents' Silva of North America.

THE LAST parts (X and XI, May 31, 1897) of Minnesota Botanical Studies form a volume of 340 pages with 42 plates. The titles of the papers are: Lichens of Minneapolis and vicinity, Bruce Fink; A rearrangement of the North American Hyphomycetes, Roscoe Pound and Frederick E. Clements; On some mosses at high altitudes, J. M. Holzinger; The forces determining the position of dorsiventral leaves, R. N. Day; On the genus Coscinodon in Minnesota, J. M. Holzinger; Observations on the ferns and flowering plants of the Hawaiian Islands, A. A. Heller; The phenomena of symbiosis, Albert Schneider; Observations on the distribution of plants along shore at Lake of the Woods, Conway MacMillan; The alkaloids of Veratrum, George B. Frankforter.

THE Pan-American Medical Congress, at its meeting held in the City of Mexico, in November, 1896, took steps to institute a systematic study of the American Medicinal Flora, through the medium of a General Commission and of special Sub-Commissions, the latter to be organized in the several countries. The Sub-Commission for the United States consists of Dr. V. Havard, U. S. Army; Mr. F. V. Coville, Botanist of the U. S. Dept. of Agriculture; Dr. C. F. Millspaugh, Botanical Curator of the Field Columbian Museum, Chicago; Dr. Chas. Mohr, State Botanist of Alabama; Dr. W. P. Wilson, Director of the Philadelphia Commercial Museums; and Prof. H. H. Rusby, New York College of Pharmacy. The Sub-Commission solicits information concerning the medicinal plants of the United States from every one in a position to accord it, particularly regarding the following points: local names; local uses, together with historical facts; geographical distribution and degree of abundance in the wild state; and if the plant is collected for market, the season of collecting, preparation for market, effect of such collection on the wild supply, price, etc. The Sub-Commission desires to compile a complete list of the plants which have been used medicinally, however trivial such use may appear, and of poisonous plants. Much interesting knowledge can be obtained from Indians, Mexicans and half-breeds; and, consequently, Indian

agencies and reservations are particularly favorable fields for investigation. All packages and correspondence should be addressed to the Smithsonian Institution, Washington, D. C., which will furnish mail franks on application.

WE have received a copy of Miss Parsons' recently published book, "The Wild Flowers of California," which will be noticed further in the May issue.—[Doxey & Co., San Francisco.]

SIR GEORGE KING has retired from the directorship of the Royal Botanical Gardens at Seebpur, Calcutta, India, and is succeeded by Dr. David Prain, F. L. S. Dr. Prain has published several valuable botanical papers, and we congratulate the Indian Government for the wisdom it has shown in this selection.

THE Oregon Forestry Association, the only forestry association in Western America, was organized November 24, 1896. Its objects are the protection and preservation of the forests of Oregon, for the use and benefit of the public in general; the acquirement and dissemination of knowledge and information pertaining to forestry and to the economic value and importance of forests to the State. The present officers are as follows: President, William G. Steel; Vice-president, Dr. W. B. Knapp; Secretary, M. W. Gorman, 75 N. Fourteenth Street, Portland, Oregon; Treasurer, Lander L. Hawkins. The Association's efforts at present are directed toward the counteraction of the influence of the sheep men in legislation. It is related to us by a correspondent that the struggle to maintain intact the present Cascade Range Forest Reserve is a very unequal one, since the sheep men are organized, possess abundance of funds and are untiring in their attempts to secure the opening of the Reserve to "settlement."

IN *Garden and Forest* for June 23, 1897, Mr. J. N. Rose, of the National Herbarium, and Mr. E. G. Baker, of Kew, describe a new genus, Robinsonella, of tree mallows, dedicated to Dr. B. L. Robinson, of the Gray Herbarium. The proposed genus contains five South American and Mexican species.

NOTES UPON SOME NORTHWESTERN CASTILLEIAS OF THE PARVIFLORA GROUP.

By Merritt L. Fernald.

A recent study of large collections of Washington and Oregon plants has made very emphatic the confusion which has long prevailed in *Castilleia parviflora* of American authors; and the attempt to identify very diverse forms of the group has made it necessary to devote more than the usual time to a study of this complex of species. Though there yet remain a number of puzzling forms, which only fresh material and close study can clear up, yet it has been possible to identify nearly all the species which have been confused with *Castilleia parviflora*, and to show that they are all probably quite distinct from that Alaskan plant.

The group of species of which *Castilleia parviflora* forms the type, consists of rather low perennials; the usually simple stems clustered from a caudex, and pilose or pilose-hispid at least above: the upper leaves at least and the bracts mostly cleft (rarely entire), the bracts generally colored crimson or scarlet (sometimes yellowish or white): the calyx equally or subequally cleft before and behind: the galea somewhat exserted, much longer than the very small lower lip which is not protruded beyond the calyx.

Castilleia parviflora was described by Bongard* in 1833 from the Island of Sitka; and specimens from the original collection of Mertens, distributed by Bongard, are deposited in the Gray Herbarium. Although only one of these specimens shows young flowers, it is confidently identified with recent excellent material collected at Disenchantment Bay, Alaska, by Frederick Funston (No. 89); and from this fresher material it has been possible to secure for examination well-preserved flowers. *Castilleia parviflora* is slender, with very thin pectinate-laciniate leaves, which dry much blacker than those of related species. From them, too, it is distinguished by its very short calyx (12 mm. or so long); and from the old species, *C. angustifolia*, *C. hispida*, etc., with which it has been confused, it

*Mém. Acad. Pétersb., ser. 6, ii (1833), 158.

differs further in its glabrous or glabrate stem. So far as known true *C. parviflora* is found only near the Alaska coast.

In 1834 Nuttall* described two species of *Euchroma* collected by Wyeth on the borders of Little Goddin River. Through the courtesy of Mr. Stewardson Brown, of the Philadelphia Academy of Sciences, I have been able to examine the original specimens of these two species, *E. angustifolia* and *E. Bradburii*. These specimens, like so many of Nuttall's types, are very fragmentary, but they show the characteristic lobing of the leaves and bracts, and the pubescence sufficiently to identify them with more complete material of recent collectors. *Euchroma angustifolia* has very narrow leaves, with two very divaricate linear lateral lobes, which, with the stem, are covered with short cinereous appressed pubescence, and many longer pilose-hispid hairs. Though Nuttall described this species as "three to four inches high," the original specimen from Wyeth seems more like the upper portion of a taller plant. *E. Bradburii* has the leaves broader than *E. angustifolia*, lanceolate or oblong-lanceolate, somewhat cuneate below, and with two pairs of ascending or somewhat divaricate linear-lanceolate lateral lobes. The stems and leaves of *E. Bradburii* are more or less pilose, but with none of the characteristic hispid hairs of *E. angustifolia*. The bracts of *E. angustifolia* were said by Nuttall to be "(apparently) lake red," while those of *E. Bradburii* were "(apparently) scarlet." In 1838 Don† transferred these two species to *Castilleia*.

Some months later, in 1838, Bentham‡ described *Castilleia hispida*. From his description alone it would be difficult to separate his plant from *C. angustifolia* (*Euchroma angustifolia*, Nutt.), but the plate§ which he cites shows his species to be a much stouter plant, with longer pilose-hispid pubescence, and with the lateral lobes of the leaves ascending rather than divaricate. This plate, which had been referred by Lindley to the Eastern *C. coccinea*, is well matched by recent specimens from the Northwest.

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*Journ Acad., Philad., vii. 46, 47.

†Gen. Syst., iv. 616.

‡Benth. in Hook. Fl. Bor.-Am., ii. 105.

§Lindl. Bot. Reg., t. 1136.

In De Candolle's Prodromus, Bentham described *C. Douglasii* from "Nova California," with the stems sparingly but stiffly pilose, with the lower leaves linear, entire, the upper broader, incised, and the calyx-lobes obovate and very obtuse. One of the original specimens from Douglas, deposited in the Gray Herbarium, agrees well with this description except that the calyx-segments are ovate-lanceolate and bluntish rather than obovate and very obtuse as described by Bentham.

In 1853, in a note upon *Castilleia hispida*, Benth., Sir William Hooker calls attention to *C. desertorum*, Geyer,* No. 511, as having the bracts yellow and scarlet variegated. Except in color, however, he did "not see how these specimens of Mr. Geyer's *C. desertorum* (n. 511) differ from what I consider to be a mere form of *C. hispida* (n. 377)." The specimen of Geyer's No. 511 which I have examined seems not to differ in habit and pubescence from *C. angustifolia*, Don, or *C. Douglasii*, Benth.

Although the three species, *Castilleia angustifolia*, *C. Bradburii*, and *C. hispida*, present fairly marked characters in their extreme forms, it has been impossible, in the light of many specimens, to find characters by which they may be constantly recognized. Many puzzling forms have been collected which might almost equally well be referred to any of them, and, on this account, it seems advisable to treat them as varieties of one species. This species, *C. angustifolia*, should, it seems, also include *C. Douglasii*, Benth., and *C. desertorum*, Geyer.

The original species, *C. parviflora*, Bong., with which all these plants have been associated, appears to be very distinct from them and to typify another group of species characterized in part by their glabrate stems and thinner leaves. Still a third group of these short-lipped species is characterized by its viscid pubescence, and is represented by a couple of recently discovered Oregon species and a somewhat obscure species from Mt. Dana.

The following synopsis and notes will perhaps make clear the conclusion to which these studies have led. In discussing this group, few forms besides those of Northwestern America have been taken

*Geyer in Hook. Journ. Bot. & Kew Misc., v. 258.

up. Other puzzling forms from farther south exist in herbaria, but without fresher material it is impossible to say where they should be referred.

*Stems sparingly pilose or quite glabrate below. (*C. Breweri*, *C. rupicola*, and *C. angustifolia*, var. *Bradburii* might be looked for here.)

+ Leaves very thin (drying blackish), 5–7-laciniate; calyx about 12 mm. long.

C. PARVIFLORA, Bong. Stems several from a stout caudex, slender, slightly angulate, 2 or 3 dm. high, quite glabrous below, more or less villous above and in the inflorescence: leaves ovate-lanceolate, 1.5 to 3 cm. long, the rather divaricate lateral lobes linear or lance-acuminate; lower leaves glabrous or sparingly pubescent on the veins beneath, the upper and the leaf-like bracts becoming villous: racemes at first very short becoming 6 or 8 cm. long: bracts mostly 5 cleft, the lower exceeding the flowers, the upper shorter: calyx-segments linear-lanceolate, acutish or obtusish: corolla about 18 mm. long, the slightly exserted galea scarcely equaling the tube; middle lobe of the short lower lip half as long as the two oblong-lanceolate lateral lobes: flowers said by Bongard to be "red." Mém. Acad. Pétersb., ser. 6, ii (1833), 158. Originally collected by Dr. Mertens on the island of Sitka, and recently by Frederick Funston at Disenchantment Bay, Alaska, Aug. 5, 1892 (No. 89).

+ + Leaves thicker (drying green or slightly blackish), 3–5-cleft or rarely entire; calyx longer, 18 mm. or more long.

C. OREOPOLA, Greenman. Stems rather stouter than in the preceding, glabrous below, somewhat pilose above: leaves lanceolate or oblong-lanceolate, 2 to 4 cm. long, the lower glabrous, entire or slightly lobed, the upper villous, cleft above the middle into ascending or somewhat spreading lanceolate or linear-lanceolate lobes: racemes about as long as those of *C. parviflora:* the rose-purple or crimson (sometimes white) bracts rather narrower, 3-cleft: calyx colored like the bracts, the divisions linear-oblong, acutish or blunt: corolla 2 cm. long, the narrow exserted galea greenish on the back, scarcely equaling the tube; lower lip green, nearly 2 mm. long, rather deeply cleft into 3 subequal linear lobes.—Bot. Gaz. XXV. 264.—Near Skagit Pass, Cascade Mts., Washington, Aug. 24, 1892,

flowers white (Lake and Hull); Horseshoe Basin, Cascade Mts., Okanogan Co., Washington, Aug., 1897, flowers white (A. D. E. Elmer, No. 696); Alpine meadows, Olympic Mts., alt. 1,540 m., Sept., 1895 (C. V. Piper); Mt. Rainier, alt. 2,150 m., July 20, 1892 (O. D. Allen, No. 11), and in rich meadows, alt. 2,000 m., Aug. 1895, "flowers crimson-purple, rarely white" (C. V. Piper, No. 2081); open ground, Goat Mts., alt. 1,540 m., July 12, 1895 (O. D. Allen, No. 134); on damp ground, Mt. Adams (Mt. Paddo), alt. 1,840 to 2,150 m., Aug., Sept., 1891 (W. N. Suksdorf, No. 2046); "Oregon," 1871 (E. Hall, No. 389); Mt. Hood, Oregon, Sept. 4, 1893 (W. J. Spillman, No. 145).

Var. subintegra. Stems much clustered: upper leaves mostly entire: flowers as in *C. oreopola*. Collected in meadows at 2,300 m., Powder River Mts., Oregon, Aug. 25, 1896 (C. V. Piper, No. 2322); common in mountain bogs, etc., 1,840 to 2,460 m. alt., Blue Mts. and Powder River (Eagle Creek) Mts., Oregon, Aug., 1897 (W. C. Cusick, No. 1724), and formerly collected on Eagle Creek Mts., Aug., 1883 (W. C. Cusick, No. 1054). Somewhat resembling *C. miniata*, but well distinguished from it by the clustered stems and shorter only slightly exserted galea.

****** Stems more or less pilose or pilose-hispid throughout or with appressed but scarcely glandular hairs: leaves and bracts sometimes glandular or minutely granular.

+– Stems minutely and sparsely pubescent below; purple-tinged leaves with strongly divaricate lobes, cleft well below the middle: galea much exceeding the corolla tube.

C. rupicola, Piper, n. sp. "Stems tufted, usually numerous, from a multicipital caudex, 1 to 2 dm. high, puberulent-hirsute to villous, especially above: leaves lanceolate in outline, deeply cleft into 3 to 7 linear rather obtuse lobes, or the lowermost rarely entire, all sparsely short-hirsute, 1 to 4 cm. long: flowers 5 to 15 in a short raceme, the lower with short pedicels; bracts resembling the leaves, but with rather broader lobes, more or less scarlet tinged: calyx 1.5 to 2 cm. long, the tube shorter than the lobes, these latter equal, oblong, 2 toothed or 2 lobed at apex or very rarely entire: corolla 2.5 to 3 cm. long, the straight or curved galea protruding far beyond the calyx-lobes, the minute saccately 3-lobed lower lip included within the latter: anthers white, protruding from the galea

but well exceeded by the style: capsule oblong, 1 cm. long: seeds numerous, deeply favose-reticulated. Abundant on perpendicular cliffs, Paradise Valley, Mt. Rainier, Washington, collected Aug. 7, 1895. The whole herbage of this species is dark purplish except when it grows in the shade. The flowers are more vividly scarlet than any other species known to me. The galea is green save the thin scarlet margins."

Plants which are undoubtedly referable to Prof. Piper's species have recently been collected by Prof. O. D. Allen. These specimens are more luxuriant than Prof. Piper's original plants, having the calyx sometimes 2.5 and the corolla 3.5 cm. long respectively.

++ Pubescence of the stem generally more dense and spreading, in two forms minute or almost wanting but with leaves cleft above the middle into ascending lobes: galea shorter than or barely equaling the corolla-tube.

C. ANGUSTIFOLIA, Don. Stems more or less clustered from a woody caudex, simple or slightly branched above, 1 to 3 dm. high, invested throughout with mostly two kinds of pubescence, the shorter fine and appressed, the longer pilose-hispid: leaves pubescent, the lower linear, entire or subentire, the upper cleft near or below the middle into 3 (rarely 5) linear or linear-lanceolate long-attenuate lobes, the lateral ones rather strongly divaricate: inflorescence at first short and dense, becoming elongated to 1 or 1.5 dm. in fruit: bracts similar to the leaves, rather broader and more deeply cleft into lance-linear bluntish segments, strongly pilose toward the base, the scarlet or rarely yellowish tips velutinous and sometimes glandular: calyx about 22 to 25 mm. long, with lanceolate or lance-ovate segments: corolla 2 to 3 cm. long, the slightly exserted galea hardly equaling the tube, and much exceeding the short 3-lobed lip.—Gen. Syst. iv. 616. *C. Douglasii*, Benth. in DC. Prodr. x. 530. *C. desertorum*, Geyer in Hook. Journ. Bot. and Kew Misc. v. 258. *Euchroma angustifolia*, Nutt. Journ. Acad., Philad. vii., 46. Specimens examined: Little Goddin River, headwaters of the Columbia (N. B. Wyeth); California (Douglas); Oregon (Geyer, No. 511); Kamiac Butte, Whitman Co., Washington, June 4, 1893 (F. L. Moore, No. 2324); foot of Humboldt Mts., Nevada, May 28 (Beckwith); near Carson City, Nevada, 1865 (C. L. Anderson, No. 87); Cedar Mts., south of Great Salt Lake, May 10 (Beck-

with); Valley of the Virgen near St. George, Utah, 1874 (C. C. Parry, No. 153); Bear Valley, Utah, 1877 (Edw. Palmer, No. 388½); Black Hills, Wyoming, July 4, 1872 (E. L. Greene, No. 1); Pacific Springs, Wyoming, 1873 (C. C. Parry). Specimens from Inghams Mt., Latah Co., Idaho, June 12, 1892 (Lake and Hull, No. 572), have the pubescence of the species but leaves approaching var. *Bradburii.*

Var. **hispida.** Plant much coarser throughout than *C. angustifolia:* stems stout, 4 or 5 dm. high, very pilose especially above with long hairs, becoming less pubescent with age: leaves 5 to 8 cm. long, rather rigid, covered on both sides with strongly scabrous more or less appressed short hairs, the margins and veins bearing longer pilose-hispid pubescence; lower leaves lance-attenuate, entire; upper becoming oblong or even obovate, cleft above the middle into three lobes, the middle lobe lanceolate, either acute or obtuse, the two lateral lobes narrower and shorter, ascending or slightly divaricate: bracts rather broader and shorter than the upper leaves, with softer pubescence, mostly 5 (rarely 7) -cleft, the tips variously shaded with yellow and red: calyx 2.5 or 3 cm. long, the reddish or yellowish segments either acute or obtuse: corolla 3 to 4 cm. long, the galea a little more than half the length of the tube, and much exceeding the short lower lip (2 mm. long) with its unequal ovate-oblong involute lobes.—*C. coccinea*, Lindl. Bot. Reg. t. 1136, not Spreng. *C. hispida*, Benth. in Hook. Fl. Bor.-Am. ii. 105.—Described by Bentham from Northwestern specimens of Douglas, Scouler, Tolmie, and Gairdner. The following specimens agree well with Lindley's plate: Hall and Harbour, No. 411; on rocky hillsides, Almota, Washington, May 27, 1893 (C. V. Piper, No. 2323); Blue Mts., Walla Walla Co., Washington, in fruit, July, 1896 (C. V. Piper, No. 2435); rocky hillsides on Hatwai Creek, Nez Perces Co., Idaho, April 30, 1892 (Sandberg, MacDougal, and Heller, No. 76). Other specimens, as Watson's No. 810 from Parley's Park, Utah, Coville and Funston's No. 554 from Panamint Mts., California, and pale-flowered specimens collected by Sandberg on hillsides in Nez Perces Co., June, 1892, are somewhat intermediate between this and true *C. angustifolia.* Sandberg, MacDougal and Heller's No. 450 from hillsides at the head of Little

Potlatch River, Latah Co., Idaho, has yellowish bracts and the galea a little shorter than in typical var. *hispida* (perhaps a transition to *C. pallida*).

Var. **adenophora.** Somewhat resembling var. *hispida*, the stout densely pilose stems 2 or 3 dm. high: the blunt shorter leaves densely covered with rather soft or somewhat scabrous short spreading hairs: bracts bearing many small glands among the sordid pilose pubescence: calyx barely 2 cm. long: corolla 2.5 cm. long, the galea hardly equaling the tube.—Collected on "bald hills" near Ashland, Jackson Co., Oregon, June 1, 1895 (Elmer I. Applegate, No. 413). C. V. Piper's No. 2,798, from moist banks, Almota, Washington, May 2, 1897, is a form between this and the var. *hispida*. It has the leaves as in var. *hispida*, but the bracts are somewhat glandular, though not so densely so as in Mr. Applegate's plant.

Var. **Bradburii.** Rather slender, 2 to 4 dm. high, simple or often loosely branched; the stems rather sparingly pilose or glabrate below: leaves 1.5 to 5 cm. long, lanceolate or oblong-lanceolate, the upper sometimes obovate, subcuneate at base, nearly all cleft above the middle into 3 or 5 lobes; the middle one oblong or oblong-lanceolate, blunt, the lateral linear-lanceolate, short, mostly ascending: calyx 2 to 3 cm. long, red or rarely yellow tipped, about equaling the similarly colored bracts: corolla exceeding the calyx by 5 to 10 mm., the galea hardly equaling the tube.—*Euchroma Bradburii*, Nutt. Journ. Acad., Philad., vii. 47. *Castilleia Bradburii*, Don, Gen. Syst. iv. 616.—Specimens examined: Little Goddin River, sources of the Columbia, June 9 (N. B. Wyeth); Lower Frazer River, 1859 (Dr. Lyall); Fort Vancouver (Tolmie); Deer Park, Lower Arrow Lake, British Columbia, May 16 and June 4, 1890 (John Macoun, Nos. 3 and 4); Orcas Island, Washington, 1858 (Dr. Lyall); dry slopes at 1,850 m., Olympic Mts., Aug., 1895 (C.V. Piper); shady places, Tacoma, May 2, 1896 (J. B. Flett, No. 104); prairies, Roy, May 19, 1889 (O. D. Allen, No. 84); Bear Prairie, near Mt. Rainier, June 4, 1895 (O. D. Allen, No. 133, distributed as *C. hispida*): Easton, Washington, June 11, 1892 (L. F. Henderson); "California," 1845 (Fremont, No. 114); Moscow Mt., Latah Co., Idaho, June 1, 1895 (C. V. Piper). Forms of this variety with long

exserted corollas resemble in inflorescence *C. affinis*. They may be distinguished from that species, however, by their broader cleft leaves, subequally cleft calyx, and smaller included lip.

Var. **abbreviata**. Plant resembling var. *Bradburii:* stems 2 dm. high, rather more pubescent below: leaves mostly obovate or ovate-oblong, the largest 2.5 cm. long, with 5 to 9 short ascending mostly blunt lobes well above the middle: calyx equaling the leaf-like bracts, 15 to 20 mm. long, the linear-oblong segments with rounded tips: corolla about 2 cm. long.—Cliffs at 1,500 m., Olympic Mts., Washington, Aug., 1895 (C. V. Piper, No. 2175). Possibly only a reduced small-flowered state of the last.

*** Stems viscid-glandular, with some additional spreading hairs.

+– Leaves mostly lobed.

++ Corolla about 2 cm. long, the galea much shorter than the tube.

C. Breweri. Stems very slender, clustered, 1.5 dm. high, minutely and sparsely glandular-pilose throughout: leaves thickish, 1 or 2 cm. long, pilose-hispid; the lowest lanceolate, entire, the upper lanceolate to obovate-lanceolate, divided near the middle into 3 lance-attenuate divaricate lobes: inflorescence at first short and dense, the apparently magenta bracts similar to the upper leaves, the lobes ascending: calyx 15 mm. long, subequally cleft before and behind, the segments broadly lanceolate, acutish or blunt: galea short-exserted, scarcely half as long as the corolla-tube; lip very short, scarcely 1 mm. long, with broadly deltoid subequal lobes: capsule hardly 1 cm. long.—On Mt. Dana, California, at 3,060 to 3,360 m., 1863 (W. H. Brewer, No. 1744).

++ ++ Corolla nearly 3 cm. long, the long exserted galea about equaling the tube.

C. Applegatei. Stems few from an elongated perennial root, decumbent at base, densely glandular and with long spreading hairs: leaves lanceolate or obovate-lanceolate, 2.5 to 4 cm. long; the lowest entire, the others 3 or 5-cleft, mostly to below the middle, into lanceolate or linear bluntish ascending lobes; all densely covered with glands, and with some spreading soft hairs, especially on the margins: racemes dense, becoming 8 or 9 cm. long: bracts similar in outline to the leaves, scarlet: calyx scarlet, 17 or 18 mm. long, the linear segments acutish; the upper three-fourths of the slender

green-backed galea exserted; the greenish lip about 2 mm. long, deeply cleft into 3 subequal linear attenuate incurved lobes: capsule glabrous, oblong, short-beaked, 1.5 cm. long.—Collected at the summit of Mt. Scott (2,800 m.), Klamath Co., Oregon, Aug. 19, 1896 (Elmer I. Applegate, No. 87).

++ Leaves mostly entire or subentire.

C. pinetorum. Stems slender, erect, 3 or 4 dm. high, less glandular than the last, and with shorter less spreading hairs: leaves oblong-linear, 3 to 5 cm. long, minutely pilose and glandular: inflorescence narrow, the bracts and flowers at first much appressed and ascending: lower bracts like the leaves, the upper becoming cleft into 3 or 5 linear roseate or bright red segments: calyx about 18 mm. long, with lance-attenuate sharp segments: corolla about 26 mm. long; the narrow galea about equaling the tube; lip 1 mm. high, the lateral narrowly deltoid lobes twice exceeding the middle one.—In pine woods, Swan Lake Valley, Klamath Co., Oregon, June 30, 1896 (Elmer I. Applegate, No. 415). A unique species in this group, on account of its entire leaves. The flower structure, however, places it here rather than in any neighboring group.

The following species, hardly belonging to the *parviflora* group, but apparently nearly related to it, seem to be well-marked plants.

C. pruinosa. Whole plant cinereous with fine often stellate pubescence: stems simple or very slightly branching above, slender, 2 to 3.5 dm. high: leaves 2 or 3 cm. long; the lowest linear, entire, the upper lanceolate or oblong-lanceolate, subentire or slightly and irregularly lobed: inflorescence rather slender, the bracts and flowers at first ascending and appressed: bracts 3-lobed above the middle, scarlet above, exceeding the calyx, spreading in maturity: calyx narrowly flask-shaped, 1 or 2 cm. long, equally cleft before and behind, the lobes divided into broadly lanceolate acutish segments: corolla 23 to 27 mm. long; the galea barely equaling the tube; lip very short, the 2 lateral broadly deltoid lobes exceeding the middle one.—On rocky ridges, Swan Lake Valley, Klamath Co., Oregon, June 8, 1896 (Elmer I. Applegate, No. 416). An anomalous species, the subsimple stems suggesting an affinity with the *parviflora* group, but in leaf and inflorescence much resembling

C. foliolosa. The pubescence, however, is not tomentose, nor are the calyx-segments rounded as in that species.

C. Elmeri. Perennial, stems simple, single or in small clusters, 2 or 3 dm. high, with the leaves and bracts viscid-pilose throughout, with some long hairs above: leaves 2 to 4 cm. long, rather crowded, ascending, the lowest linear-acuminate, the upper lanceolate or oblong-lanceolate, becoming bluntish; the broader indistinctly 3-nerved: bracts oblong or obovate-oblong, entire or rarely slightly lobed at the tip, 2 to 2.5 cm. long, the lowest green, the uppermost crimson or rose-purple: calyx 18 or 20 mm. long, subequally cleft half way to the base (a little deeper cleft before than behind); the lobes entire or cleft into lanceolate segments: corolla 2 to 2.5 cm. long, the green-backed galea half as long as the tube; the lip included or slightly exserted, 1.5 to 2 mm. long, with 3 oblong blunt incurved lobes, about one-fourth as long as the galea.—On Wenatchee Mts., 19.3 km. south of Ellensburg, Washington, July 5, 1897 (A. D. E. Elmer, No. 457). A puzzling plant, seemingly distinct from any described species, but of doubtful affinities. Habitally it resembles forms of *C. integra*, from which it is separated by its very different pubescence. From the *parviflora* group it is distinguished by its usually entire bracts; and from most of that group it differs in its comparatively short galea. In this character as well as in its entire leaves and bracts the plant approaches the *pallida* group, though the galea is rather longer than is generally found in that group.

NOTES UPON SOME RARE WYOMING PLANTS.

By Aven Nelson.

A plant's range or geographical bounds may be extended or restricted accordingly as one draws the characters of the species loosely or rigidly. We now frequently see so-called "polymorphous" species, of wide geographical range, broken up into well-defined forms of greatly restricted range. This process of segregation becomes possible only after extended field work, and the accumulation of large series of specimens of the several forms, in order that the fairly constant characters may be the more surely made out. Most of the plants in the following list extend the supposed range of the species, but, as has so often occurred in the past, a completer knowledge of the different forms may show that what now seems to be only such slight differences as environment might produce are good diagnostic characters. It is no easy matter to determine the relative importance of the factors that govern the range of a species. Miles and mountain ranges seem, to me, less important than soil conditions. But with the same soil conditions, how far must variation in size, branching, surface (hirsuteness, etc.), color of flowers and other characters due to climate, or other conditions, proceed before the plants may be considered specifically distinct? Upon one's answer to this question largely depends the disposition that will be made of certain material.

The notes upon the following plants may be of interest as indicating how largely soil conditions are responsible for similar, if not identical, forms in widely separated localities. Most of the plants are from the Red Desert of Wyoming, certain localities of which are no doubt the counterpart of the type localities of at least some of the species here listed.

Streptanthus longirostris Watson. Seemingly typical specimens of this were secured in sandy, alkaline soil at Green River (3,040), and at Point of Rocks (3,082), thus extending the range eastward to south-central Wyoming.*

*Unless otherwise stated, all are from my collections of 1897.

STREPTANTHUS CORDATUS Nutt. The specimens secured of this agree very closely with the description,* even to the bristles on the teeth and petioles of the radical leaves. Flowers were not secured, but the fruit-bearing racemes are dense, from 10 to 20 cm. long; pedicels short, stout; pods divaricate, curved ascending, 4 to 6 cm. long, about 4 mm. wide. Collected near Evanston, which Dr. Greene † thinks must be near the type locality. The pods on these specimens, being divaricate-ascending instead of deflexed or downwardly curved, do not accord with those of the specimens that Dr. Greene considers typical; they differ even more from his *S. crassifolius* in the broader pod as well as in the broader cauline leaves.

STANLEYA BIPINNATA Greene ERYTHEA, iv. 173. The specimens represented by the following number are probably the first that have been secured since the type specimens were collected by Professor Greene at Rock Creek in this state. The present specimens probably do not have the leaves so fully dissected as the type. On the bluffs of North Vermillion Creek, July 17 (3,562).

ACER GRANDIDENTATUM Nutt. Small clumps of this shrubby Utah maple were found on one of the foothills near Evanston (2,952).

TRIFOLIUM RYDBERGII Greene, Pitt. III, 222 (1897). *T. longipes reflexum* Aven Nelson, First Rep. Fl. Wyo. 94 (1896). A peculiarly fine species widely distributed in this state; Big Creek, Carbon County (3,971).

This state possesses a marvelously rich Astragalus flora, the University collection already containing upwards of 45 species. Among these the following are noteworthy:—

ASTRAGALUS ARIETINUS Jones. Collected at Evanston (2,968).

ASTRAGALUS BODINI Sheld. This seems to have been reported so far only from this state. It is very abundant in wet meadows, and is a good forage plant; Laramie (3,395).

ASTRAGALUS GLAREOSUS Dougl. From near the probable type locality. Mr. Rydberg, who kindly compared these specimens with the Columbia Herbarium material, pronounces these typical, and he

* Fl. N. A. I. i. 169.

† Pitt. III 227.

finds that all but one specimen of those labeled *A. glareosus* in that collection, belong to other species; Evanston (2,990).

ASTRAGALUS GRAYI Parry. This I have suspected might prove to be only a form of *A. pectinatus* Dougl., but the excellent specimens secured show it to be distinct. In the Red Desert near Bitter Creek station (3,115). Has this been secured outside of Wyoming?

ASTRAGALUS INEPTUS Gray. Its range is extended materially by specimens from Evanston (2,978).

ASTRAGALUS JEJUNUS Wats. Very abundant on gravelly hill-tops near Evanston (2,973) which probably is not far from type locality. Also on the Bitter Creek Hills.

ASTRAGALUS MEGACARPUS (Nutt.) Gray. Excellent specimens from the saline banks of Bitter Creek (3,113). Only from Utah heretofore(?).

ASTRAGALUS SCOBINATULUS Sheld. On north Vermillion Creek, Sweetwater County (3,786).

ASTRAGALUS VIRGULTUUS Sheld. Specimens which tally exactly with the type from Colorado were secured at Medicine Bow Crossing, near Elk Mountain (4,091).

ASTRAGALUS UTAHENSIS (Torr.) T. & G. To Utah and Nevada may now be added Wyoming; Evanston (2,965).

SULLIVANTIA SULLIVANTIA (T. & G.) Britton. From the type locality in Ohio, to Wyoming is a wide range, but the spray-washed, limestone ledges, whether here or there, produce remarkably similar forms of this handsome Saxifrage. Wolf Creek, Sheridan County, 1896 (2,302).

EDWINIA (JAMESIA) AMERICANA (T. & G.) Heller. As in the preceding, similar habitat gives similar product. The plant from the type locality in New Mexico is duplicated on the rocky cliffs in the Laramie Hills.

TIEDMANNIA FENDLERI C. & R. This has not heretofore been accredited to Wyoming. It has now been twice secured on the southern border, the last time at Battle Lake (4,183).

ANGELICA LYALLI Watson. This is also very rare, and was named from a range to the northwest, but has now been twice secured from the southeastern part of the state (3,460).

PEUCEDANUM NEVADENSIS Watson. Evanston (3,086).

PEUCEDANUM MACROCARPUM Nutt. Point of Rocks (3,016).

LEPTOTÆNIA MULTIFIDA Nutt. Evanston (2,982).

The three preceding, I believe, have their range considerably extended by the localities noted above.

VALERIANA SITCHENSIS Bong. A plant that is not rare in sub-alpine meadows; Battle Lake (4,203).

CHRYSOTHAMNUS COLLINUS Greene. Point of Rocks (4,435).

CHRYSOTHAMNUS LINIFOLIUS Greene. Granger and Point of Rocks (4,440).

The two preceding are both common, the former on the dry, sandy hills of the Red Desert, and the latter on the wet banks of all the saline creeks of the region. The above numbers are from near type localities.

CHRYSOTHAMNUS PARRYI (Gray) Greene.

CHRYSOTHAMNUS VASEYI (Gray) Greene.

The last two are just as common in the sub-alpine parks of southern Wyoming as they are in Colorado.

XYLORRHIZA PARRYI (Gray) Greene. Red Desert station (3,123).

XYLORRHIZA VILLOSA Nutt. Laramie Plains (3,167).

These handsome Asteraceous plants are characteristic of the strongly alkaline slopes and ridges of southern Wyoming.

TETRANEURIS (ACTINELLA) TORREYANA (Nutt.) Greene, Pitt. III. 265. This excellent species covers all the rocky points and slopes in the Laramie Hills, where it comes into blossom early in May and disappears by the middle of June.

TETRANEURIS LANATA (Nutt.) Greene. l. c. An inhabitant of the white hilltops in the Green River bluffs (3,068). This species, as well as the preceding, has practically been suppressed for some years, but no one can doubt the validity of either who sees the authentic specimens secured the past season.

Among the *Senecios* the following may be mentioned as rare and seldom, if ever before, reported from this state: *Senecio Bigelovii* Gray, and *S. petraeus* Klatt.

HELIOTROPIUM CURASSAVICUM L. Steamboat Lake, 1896 (2,063). In this we have another example of a plant of very wide range but peculiar habitat. Never found, I think, except in strongly saline soil.

DODECATHEON JEFFREYI Moore. Evanston (3,012). Reported now from this state for the first time.

ASCLEPIAS CRYPTOCERAS Watson. This, the handsomest of milkweeds, continues to be found at long intervals in this state, the state from which it was originally described. It was found in great abundance in the Platte River bluffs near Fort Steele, in full blossom, June 5 (3,132).

PLANTAGO TWEEDYI Gray. To find so rare a plant as this in great abundance was an unusual pleasure. In 1895 three plants were secured in the Medicine Bow Mountains, but in 1897 it was found in abundance at Battle Lake, in the Sierra Madre Mountains. It inhabits moist, grassy places in the sub-alpine region (4,158).

ERIOGONUM ACAULE Nutt. In all my collecting in the state I have but once found this cæspitose form, which that time nearly covered a gravelly, stony ridge on the Laramie Plains (1,279).

ERIOGONUM ANDINUM Nutt. This species, for some time suppressed, I think should be restored to specific rank. Often valid species are suppressed because specimens sent out under that name do not represent either the type nor its description. This, in my judgment, is why *E. cæspitosum* Nutt. has been allowed to swallow up this good species, of which excellent specimens have now been secured; Evanston (2,956).

ERIOGONUM EFFUSUM Nutt. Of the rarity of this outside of Wyoming I am unable to speak but with us it has been met with only in the saline hills on the southern border of the Red Desert; Salt Wells Creek (3,753).

POLYGONUM KELLOGGII Greene. A small form of the higher mountains, secured for the first time the past season; Battle Lake (4,161).

SALIX BARRATTIANA Hook. Prof. W. W. Rowlee, who has kindly named my willows of the season of 1897, pronounces this one of the great finds of the year. He cites Mr. Bebb's discussion

of this species in Contr. Natl. Herb. III. 573, a portion of which I quote: "*Salix Barrattiana* Hook. is one of the rarest of North American willows. For more than fifty years it was known only from Drummond's specimens in the Hookerian herbarium. Type locality, 'Alpine swamps in the Rocky Mountains.' It was rediscovered by Prof. John Macoun, July 28, 1885, in thickets at high elevations, Kicking Horse Lake, . . . and later, August, 1890, was collected in the same locality by Mr. James Macoun, in fine specimens of both fruit and matured leaves." My specimens were secured in a swamp in the Laramie Hills, at about 8,000 feet. Only a few specimens were secured, and these are not mature, but, now that a locality is known, pains will be taken to secure enough material so that this fine species may have fuller representation in the herbaria.

NEWS NOTES AND CURRENT COMMENT.

PROF. W. A. SETCHELL sailed from San Francisco May 16 for Victoria, British Columbia, *en route* to the eastern United States, where he will spend the summer in research work in the cryptogamic herbaria of Yale and Harvard Universities.

DR. EDW. W. CLAYPOLE, lately of Buchtell College, Akron, Ohio, has accepted the Professorship of Natural History in the Pasadena Polytechnic Institute of Southern California.

WE regret to note the death of M. Thomas Kirk, F. L. S., of Wellington, New Zealand. M. Kirk was the author of several papers and monographs dealing with the New Zealand flora. He is best known by his "Forest Flora of New Zealand," in which were figured and described all the known trees and shrubs of the islands; the exploitation of the timber is also treated of, so that the work forms a complete treatise on the forestry of New Zealand.—J. B. D.

THE *Gardeners' Chronicle* of March 5, 1898, illustrates a gigantic chrysanthemum raised in the Imperial Gardens at Tokyo. The specimen is trained into a low, cone-shaped design, which is six feet high and ten feet through at the base in one direction and fifteen

feet in the other direction; the number of flowers is 812, the colors pink and white, each flower being on the average eight and three-fourths inches in diameter. The plant is interesting as showing a phase of the progression of cultivated forms in chrysanthemum.

THE desire and the book were happily met when Miss Parsons gave to Californian people, towards the end of the year 1897, her book upon "The Wild Flowers of California; Their Names, Haunts, and Habits." The volume, as the title would indicate, is for the use of those who possess no botanical knowledge and yet crave the names of the very common and showy plants, many of which in their season color the plains and illumine the hillsides. The classification is based on color—doubtless the most satisfactory arrangement for a book of this kind—and perhaps one-half of the species described are illustrated with full-page plates, of which there are over two hundred. The choice of plants to be included has been made with good judgment; for, although it was possible to describe and illustrate but a very small part of the flora of California, yet the common plants which are likely to attract attention on account of their showiness or curious character, the amateur will have little difficulty in locating by aid of the text and the drawings. The drawings are not, however, uniformly satisfactory, being too stiff and "wooden" in some cases, the foliage of *Ceanothus thrysiflorus*, for example, answering better to a representation of plums than of leaves. It is our judgment that the text is the better product: the untechnical descriptions and notes are original and attractive: the background is occasionally colored with the history and romance of California, evidencing the breadth of the writer's sympathies. The species listed, almost without exception, are endowed with common names, which are for the most part pleasing, but there is an obvious tendency, we must say, to overwork "gold" and "golden," and some are so fanciful and highly colored that they suggest the drawing-room of a city rather than the flower-crowned Coast Ranges, the sun-scorched interior valleys, or the hot, dusty trails of the Sierras. The book is now in its second edition. It is worthy of many more. [DOXEY, at the Sign of the Lark, San Francisco.]

THE second fascicle of "Howell's Flora of Northwest America" was issued April 1, 1898. It finishes Rhamnaceæ, begun in the first

fascicle, and concludes with Garryaceæ. In general, this botanist is a follower of the school of nomenclature which centers in America chiefly around Professor Greene, of the Catholic University at Washington, D. C., and the botanists of Columbia University. Besides the changes necessitated by the adoption of Article IV of the Rochester Code, the "Once a Synonym always a Synonym" provision of this school, he goes even farther than they do in splitting up old-established orders, genera and species into their respective suborders, sections, and varieties. This tendency, if carried out to its logical conclusion, will render the naming of individuals necessary and will result in ever-increasing confusion. The pursuit of names rather than knowledge of plants will come to be the goal of the efforts of the systematic botanist. Nothing else can be studied. The great complication will take so much time that there will be none left for other work. However, the pendulum will probably swing back, as it has done before, to the other extreme. Undoubtedly much good will have been accomplished through this analytical study, and consequently the future synthesis be nearer the truth than it was before.

The conscientious striving for truth which distinguishes the work of this botanist, his independence in asserting his own views, and his thorough, careful work, command our respect; while the enthusiasm and self-denial which have resulted in the publication of a work of this magnitude by an author comparatively poor in money, at his own expense, commands, again, our admiration.

Some of the most noticeable changes from the nomenclature of the Botany of California, Geological Survey, are the following: Rosaceæ is divided into Amygdalaceæ, Pomaceæ, Rosaceæ; Saxifragaceæ is divided into Saxifragaceæ, Hydrangeaceæ, Ribesiaceæ; Cornaceæ is divided into Cornaceæ, Garryaceæ; Prunus and Cerasus are separated; Pyrus is divided into Malus and Sorbus; Comarum is removed from Potentilla; Spiræa excludes Holodiscus, Aruncus, and Filipendula, which are considered distinct genera; Saxifraga is divided into Peltiphyllum, Saxifraga, Saxifragopsis; Tellima and Lithophragma are considered distinct genera, as well as Mitella and Mitellastra; Œnothera is split into Onagra, Œnothera, Anogra, Taraxia, Sphærostigma, Chylismia, Pachylophus; Glosso-

petalon becomes Fossellesia; Hosackia disappears in Lotus; Nuttallia becomes Osmaronia; Purshia is Kunzia; Eriogynia is Luetkea; Suksdorfia is Hemieva; Tolmiea is Leptaxis; Mammillaria is Cactus, and so on.—ALICE EASTWOOD.

THE sketch of Dr. Bolander promised for this month, is unavoidably delayed. Although Bolander's work for Californian botany is conspicuous, full details of his life are not readily obtainable; yet it is hoped to make the written tribute to his memory as worthy as the circumstances of its preparation will permit.

THE PLANT INHABITANTS OF NOB HILL, SAN FRANCISCO.

By Alice Eastwood.

When the rains terminate the long dry season in California, it is not winter that they usher in, though the season is so called. The time of rest for plants is not to begin then but to end. To the cotyledons wrapped up in the tiny seeds, to the buds folded carefully in their scaly coverings on the woody stems of shrubs and trees or buried beneath the earth in various disguising forms, the first rain drops whisper that the time of awakening is approaching. Soon the brown landscape of summer suddenly becomes green, a tender green, misty, as if it belonged to the atmosphere rather than to the earth. A close view discovers the surface of the ground inhabited by innumerable tiny strangers, baby plants clothed in their first leaves, delicate, beautiful little beings whose individual existence is seldom recognized, but whose presence has made for us a new world.

At all times of the year green and blooming plants can be found on our hills and in our valleys. It is impossible to assign a definite time to mark the last of the summer flowers and the first of those of spring. When on a January ramble we can find golden-rod and aster, trillium and iris, in the same neighborhood, winter seems lost and spring and fall most uncertain. These lingering stragglers of summer and early arrivals of spring bridge over the chasm that winter makes in less favored climes; but spring comes in with a rush that is undreamed of in countries where "winter lingers in the lap of spring."

Not alone the unfrequented hills and valleys show the wonderful effect of moisture; the busy streets of the city, also, become tinged with green. The cobble-stones afford protection to many a tiny plant even where the traffic is considerable; while on the hills that are too steep to permit anything except the cable cars being hauled up and down, a wilderness of plants appear, often so dense as to conceal the cobble-stones beneath. It is refreshing amid so much that is dirty, shabby, and ugly in the city streets, to behold these

oases of verdure and to reflect how nature tries to cover over the defacements of man and once again make all beautiful.

In December, grasses and erodiums are quite evident; through January and February the appearance suggests a pasture whereon a few cows or sheep might obtain a fair living; while through March, April, and May the height of the season prevails and the greatest number of species are in bloom. From then to December again the dry brown aspect of summer prevails, though a flowering plant may occasionally be found. To ride in the cable cars in the winter months, within a short distance of the most crowded part of the city, up steep hills where the vegetation almost conceals the iron rails of the car track, is an experience that amazes the stranger and causes him to marvel at the wonderful effects of soil and climate.

Nob Hill is the best known of all the hills of San Francisco. At its base, to the east, lies Chinatown, where more inhabitants are to be found to the square rod than in any other part of the city. On its summit rise the almost uninhabited palaces of the most wealthy.

During the winter of 1896 my morning walk led me over Nob Hill. I became interested in the plants that were appearing every day and began to collect with a view of finding out how many species could get a living in such apparently unfavorable surroundings, as well as what kinds of plants they were, where they had come from and what seemed to be their prospects. Mason, Taylor, and Jones Streets from California to Bush Streets; Jackson, Washington and Clay Streets from Jones to Powell Streets, were my collecting grounds. The greatest number of species came from Washington Street, though Jones Street presented the most luxuriant appearance. This is probably due to the steep incline of Jones Street and its sunny southern exposure. Very rarely is a team driven up these streets, so that there is little danger of the plants being tramped down.

As the streets of Nob Hill were not paved so very long ago and there were no plants left, no seeds even, when the cobble-stones were laid, this recent flora suggests the most adventurous and most hardy plant pioneers. Some seeds have undoubtedly been washed down from the Reservoir Hill, where alfalfa, clover, and grasses have been planted; some have come from the hill that rises cliff-like

on Washington and Jones Streets, where different inclines of exposed strata show how mountains are made, and the washing down of rocks and earth in rainy weather indicates how mountains are leveled; but most of them have been wafted to their present home by the winds or transported in various ways through the agency of animals. They are plants that have shown ability to maintain themselves in any environment, to spread rapidly and persist. Most of them are cosmopolitan. In the list of sixty-four species, fifty-five are foreigners, only six are peculiar to the Pacific Coast, two are natives also of the Rocky Mountain region, and one is found in Mexico.

The commonest of all is a tiny delicate composite that has come all the way from New Zealand and Australia. It is in bloom the first and is most persistent throughout the entire year, and advances into the busiest streets. This little plant has finely-cut leaves and small button-like heads of pale green flowers. It is known as *Cotula australis*, and is a sister of *C. coronopifolia*, the common plant that grows near water and is popularly called "Brass-buttons."

Among the sixty-four one weed appears that California has furnished to the civilized world. This is a composite similar in appearance to the mayweed or dog-fennel but lacking the white rays. It is known botanically as *Matricaria discoidea*. The early Spanish inhabitants named it "Manzanilla," from the order of ripe apples peculiar to its foliage and flowers.

The true Californian plants, those that have been content to remain at home and have never yet been called weeds, were represented by very few specimens of each and seemed lost amid the numerous foreigners. It was as if the neighboring hills, where primeval conditions to some extent still reigned, had sent these down as messengers to see whether amid the luxuriant vegetation below, there was not a land teeming with milk and honey for their children.

This vegetation, springing up in the very heart of civilization on public roads where the cobble-stones are laid as closely as possible, entirely spontaneous within a few years, indicates by its cosmopolitan character the final effects of civilization. The tendency is to reduce mankind as well as plants to one dead level. In time, the tribes and races that persist in their individuality will either become

exterminated or be driven to inaccessible places. Whether the type that persists is to be Oriental or Occidental, time alone can decide.

In the following list the families of plants are ranked according to the number of the species collected. Specimens are in the Herbarium of the California Academy of Sciences.

Compositæ.

1. *Achillea Millefolium* L. (Yarrow). Northern Hemisphere.
2. *Anthemis Cotula* DC. (Mayweed, Dog-fennel). Europe, Africa, North America.
3. *Bæria uliginosa* Gray. California.
4. *Centaurea Melitensis* L. (Tocalote). Europe.
5. *Centaurea solstitialis* L. (Star Thistle). Europe.
6. *Cotula australis* Hook. Australia and New Zealand.
7. *Erigeron Canadensis* L. (Flea-bane). American, now Cosmopolitan.
8. *Hypochæris glabra* L. Mediterranean Region.
9. *Madia sativa* Molina (Tar-weed). California.
10. *Matricaria discoidea* DC. (Manzanilla). California.
11. *Senecio vulgaris* L. (Old Man of Spring). Cosmopolitan.
12. *Silybum Marianum* Gærtn. (Milk Thistle). Mediterranean region.
13. *Sonchus oleraceus* L. (Sow Thistle). Cosmopolitan.
14. *Taraxacum officinale* Weber. Cosmopolitan.
15. *Troximon apargioides* Less. California.
16. *Troximon humile* Gray. Western North America.

Gramineæ.

1. *Avena fatua glabrescens*, Coss. (Wild Oats). Europe, Asia, North America.
2. *Avena barbata* Brot. (Wild Oats). Europe, Asia, North America.
3. *Bromus breviaristatus* Buckl. North America.
4. *Bromus intermedius* Guss. Mediterranean region.
5. *Bromus rigidus* Roth. Mediterranean region.

6. *Festuca Myurus* L. Northern Hemisphere.
7. *Hordeum murinum* L. Africa and Orient.
8. *Lolium perenne* L. Europe, Asia, North America.
9. *Panicum Crus-Galli* L. (Barn-yard Grass). Cosmopolitan.
10. *Dactylis glomerata* L. (Orchard Grass). Europe, Asia, North America.
11. *Poa annua* L. Cosmopolitan.
12. *Polypogon littoralis* Smith. Europe.

LEGUMINOSÆ.

1. *Lupinus bicolor* Lindl. (Lupine). California.
2. *Medicago denticulata* Willd. (Bur Clover). Europe.
3. *Medicago lupulina* L. Europe.
4. *Medicago sativa* L. (Alfalfa). Europe.
5. *Melilotus Indica* All. (Sweet Clover). Europe and Asia.
6. *Trifolium gracilentum* T. & G. (Clover). Western North America.
7. *Trifolium pratense* L. (Red Clover). Cosmopolitan.

CRUCIFERÆ.

1. *Alyssum maritimum* L. (Sweet Alyssum). Europe.
2. *Brassica campestris* L. (Wild Mustard). Cosmopolitan.
3. *Capsella Bursa-pastoris* Moench. (Shepherd's Purse). Cosmopolitan.
4. *Senebiera pinnatifida* DC. (Wart Cress). Cosmopolitan.
5. *Sisymbrium officinale* Scop. (Hedge Mustard). Europe.

POLYGONACEÆ.

1. *Polygonum aviculare* L. (Knot-weed). Cosmopolitan.
2. *Polygonum Persicaria* L. (Smartweed, Lady's Thumb). Cosmopolitan.
3. *Rumex Acetosella* L. (Sour Dock). Europe and Asia.
4. *Rumex crispus* L. (Curly Dock). Europe and Asia.
5. *Rumex obtusifolius* L. (Dock). Europe and Asia.

GERANIACEÆ.

1. *Erodium moschatum* Willd. (White-stemmed Filaree). Mediterranean region.

2. *Erodium cicutarium* L'Her. (Red-stemmed Filaree). Mediterranean region.

3. *Oxalis corniculata* L. (Sorrel). Cosmopolitan.

CHENOPODIACEÆ.

1. *Chenopodium album* L. (Pigweed, Lambs-quarters). Cosmopolitan.

2. *Chenopodium ambrosioides* L. (Worm Seed). Cosmopolitan, native of Mexico.

3. *Chenopodium murale* L. Cosmopolitan.

4. *Roubieva multifida* Moq. South America or Mexico.

CARYOPHYLLACEÆ.

1. *Silene Gallica* L. (French Campion). Orient.

2. *Spergularia Clevelandi* Robinson. (Sand Spurry). California.

3. *Stellaria media* Smith (Chickweed). Europe.

MALVACEÆ.

1. *Malva pusilla* Smith (Large-flowered Mallow). Europe.

2. *Malva parviflora* L. (Small-flowered Mallow). Europe.

PLANTAGINACEÆ.

1. *Plantago lanceolata* L. (English Plantain). Europe and Asia.

2. *Plantago major* L. (Plantain). Northern Hemisphere.

AMARANTACEÆ.

Amarantus deflexus Willd. (Amaranth). Europe.

ILLECEBREACEÆ.

Pentacæna ramosissima Hook & Arn. (Sand Mat). Mexico and California.

SCROPHULARIACEÆ.

Veronica arvensis L. Northern Hemisphere.

LINACEÆ.

Linum (probably *usitatissimum* L.) (Flax).

INDIGENOUS SPECIES PECULIAR TO CALIFORNIA OR THE PACIFIC COAST.

1. *Bœria uliginosa* Gray.
2. *Madia sativa* Molina.
3. *Matricaria discoidea* DC.
4. *Troximon apargioides* Less.
5. *Lupinus bicolor* Lindl.
6. *Spergularia Clevelandi* Robinson.

SPECIES INDIGENOUS TO CALIFORNIA BUT NOT PECULIAR TO THE PACIFIC COAST.

1. *Oxalis corniculata* L.
2. *Erigeron Canadensis* L.
3. *Achillea Millefolium* L.
4. *Pentacæna ramosissima* Hook & Arn.
5. *Bromus breviaristatus* Buckl.
6. *Troximon humile* Gray.
7. *Trifolium gracilentum* T. & G.

ESCAPES FROM GARDENS.

1. *Alyssum maritimum* L. (Sweet Alyssum).
2. *Linum* (Flax).
3. *Oxalis* (White Oxalis).

Academy of Sciences, San Francisco.

OPEN LETTERS.

Not Beal but Linnæus.

ON page 25 of the March issue of ERYTHEA Mr. J. Burtt Davy has a short article on "The Botanical Name of the Ribbon Grass." He credits Prof. Beal with being the author of the name *Phalaris arundinacea* var. *picta* (1896), and states that this name is antedated by that of Nicholson *P. arundinacea* var. *variegata* (1886).

Both names have always been in use, either as varietal or specific, each author adopting that name (either *picta or variegata*) which to him seemed the more appropriate, Asa Gray using *picta* as a varietal name in the fifth edition of the "Manual," antedating Nicholson some eighteen years. The proper varietal name, authority, date and place of publication are: *Phalaris arundinacea* Linn.; var. *picta* Linn., Sp. Pl. Ed., p. 80 (1753). Such statements from one making the Gramineæ a subject of special study are, to say the least, surprising. O. A. FARWELL.

Detroit, Mich., May 12, 1898.

NEWS NOTES AND CURRENT COMMENT.

DR. ROLAND THAXTER, Assistant Professor of Cryptogamic Botany in Harvard University, sailed from Boston for the Naples Biological Station the last week in March. His leave of absence extends until September.

C. F. BAKER and F. S. EARLE, associate botanists of the Alabama Biological Survey, are engaged this summer in an extended exploration of the La Plata and San Juan Mountains of southwestern Colorado.

THE seventh session of the Hopkins Seaside Laboratory of the Leland Stanford Junior University began June 6, 1898. Of the five courses offered one is botanical, a "Course in General Cryptogamic Botany," given by Mr. C. P. Nott, Assistant in Botany, University of California.

THE University of Aberdeen of Scotland has been donated £15,000 for the foundation of a garden to be known as the Cruickshank Botanical Garden. James W. Trail, Professor of Botany in the University, is ex-officio a member of the Board of Trustees.

A NEW VIOLET FROM WASHINGTON.

By C. V. Piper.

In a collection of plants from the Olympic Mountains recently sent me by Mr. J. B. Flett occurs a handsome violet that can not be referred to any described species. Mr. Flett states that "it grows in crevices of volcanic rock at an altitude of 6,000 feet, almost always accompanied by the beautiful little *Campanula aurita* Greene. The very appropriate name of Rock Violet is bestowed upon it by the few tourists who enter the mountains." It is a pleasure to dedicate the plant to its enthusiastic discoverer.

Viola Flettii. Stems two to several, from upright or horizontal scaly root-stocks, these abundantly covered with rather stout roots, the stems 10–15 cm. high, bearing from 2 to 4 leaves near the summit, which are just exceeded by the flowers borne in their axils; leaves thickish, the veins (not obscure) broadly reniform, serrate with blunt closely appressed teeth, the terminal tooth large and making a rather conspicuous blunt apex to the leaf; radical two or three in number, 2–2½ cm. long, by 3–4 cm. wide, on petioles about 10 cm. long; stipules broadly lanceolate, scarious, about 6 mm. long; cauline leaves similar but usually longer in proportion to the breadth, 1–2 cm. long, by 1–2½ cm. broad on petioles 2–3 cm. long or the uppermost shorter; stipules purplish, deltoid-ovate, acute, 4 mm. long; flowers 2 to 4, one in the axil of each of the cauline leaves which are exceeded by the peduncles; petals lavender-violet, yellow at base with dark purple veins, 12–14 mm. long; lateral petals sparsely papillose bearded at base; spur short and blunt; sepals lanceolate, obtuse, 3-nerved, minutely puberulent, 5 mm. long; style thickened upwards, the stigma obliquely antrorse, not beaked or bearded, though a few papillose hairs occur near the apex; fruit not seen.

Collected July 20, 1897, in the Olympic Mountains near Mount Constance. Excepting the flowers the whole plant is perfectly glabrous. This species seems most nearly related to *V. cuneata* Watson, though in aspect the plant more closely resembles *V. glabella* Nuttall.

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THE LUPINES OF LOS ANGELES COUNTY, CALIFORNIA.

By Anstruther Davidson, M. D.

In studying the Leguminous plants the Lupines appear to me to present more than ordinary difficulty in determination and that this difficulty is not wholly confined to amateurs is strikingly illustrated by the confusion still pervading our nomenclature, as well as by the multiplicity of synonyms of eminent authorities. The existing discrepancies may partly be accounted for by the difficulty of presenting in a descriptive account the peculiarities of each species; and partly by the variability of the different species under special conditions of soil and climate. Though the Botany of California makes no mention of, even gives no hint of any possible differences between the Lupines of northern and southern California, yet in some species differences undoubtedly exist, or the descriptive details in the Botany of California and the Flora Franciscana are inaccurate or incomplete.

I have this season carefully examined the Lupines of Los Angeles County and so far I have found practically no marked variation in the individual species, though these differed in some particulars from the northern types, as will be detailed under their respective headings. Finding so little variation in the individual in general it seemed natural to suppose that in some special particulars there might exist an equal constancy.

I first investigated the calyx lobes, the depth of cleft, etc., and while presenting a fair uniformity in a number of individuals, yet in some species they were too variable to be relied on as differentiating factors. The ciliation of the keel I have, however, found so constant in each species as to give, by the peculiar distribution of the hairs, an easy method of distinguishing the different species found here. As our authorities make mention of the ciliation in but few of the Lupines, I am unable to compare the northern and southern forms in this particular; but if it prove with the former as constant as it does with those of this district, it may give not only a ready means of identification but serve as a useful factor in the differentiation of allied or variable species.

In the following notes I will detail in what respect our forms differ from those described in Greene's Flora Franciscana, especially as to the disposition of the ciliation on the keel. In speaking of the keel I use the term "fork" for the ununited lower margin of the petals forming the keel.

L. HIRSUTISSIMUS Benth. Common in dry places. Bracts deciduous: lower calyx-lip 3-toothed: keel ciliate along the fork only: standard in this as in all the others here found, becoming darker and usually redder in age.

L. TRUNCATUS Nutt. Common. Bracts persistent till pods full grown: upper calyx-lip open cleft, lower very slightly 3-toothed: keel ciliate above for posterior three-fourths and slightly along the fork.

L. SPARSIFLORUS Benth. Frequent. Bracts subpersistent: upper calyx-lip open cleft, lower trifid, sometimes quite deeply: keel finely ciliate on posterior one-fourth and on the fork.

L. MICRANTHUS Dougl. Very common. Bracts caducous: lower calyx-lip usually minutely 3-toothed: keel ciliate nearly half its length above, the fork naked.

L. AFFINIS Agardh. Very common. Leaves obtuse with a recurved mucronation: bracts scarcely setaceous, caducous: upper calyx-lip open bifid, lower seemingly always entire: keel shortly ciliate posteriorly and very sparsely in the fork.

L. CYTISOIDES Agardh. Frequent on mountain streams. Keel densely ciliate on posterior half, less so on fork, a few scattered hairs on side of keel.

L. FORMOSUS var. BRIDGESII Greene. Very common on the plains. Bracts at least one-half shorter than in the northern forms: upper calyx-lip shortly bifid: standard with the margins coherent at the apex: keel naked throughout.

L. ALBIFRONS Benth. Frequent on the hill slopes near the city of Los Angeles. Flowers generally light blue, sometimes pure white: keel ciliate on anterior two-thirds, fork naked.

L. CHAMISSONIS Esch. Abundant at Redondo and St. Monica. Upper calyx-lip cleft, lower entire: keel wholly naked.

L. CHAMISSONIS var. LONGIFOLIUS Watson. Mt. Disappointment and at Rock Creek above 4,000 ft. alt.; probably on all the higher

hills. Upper calyx-lip cleft, lower entire or occasionally with the minute teeth: keel ciliate above except the extreme tip: fork very sparsely ciliate. The leaves on these specimens on account of the increased length of some of the hairs appear much less silky than in the type.

L. DENSIFLORUS Benth. From Newhall to the desert; frequent. Keel densely ciliate on posterior third above: a few scattered cilia on fork: usually a few hairs on anterior edge of the base of the lateral petals.

L. BREVICAULIS Wats. Lancaster and surrounding desert. Keel smooth.

L. CONCINNUS Agardh. Calyx above deeply cleft, the lobes widely divergent: lower 3-toothed. Petals hairless. Bracts persistent until ripening of fruit.

L. BREWERI Gray. Bear Valley, San Bernardino. Keel ciliate in middle third.

NOTES ON THE FLORA OF MARIN COUNTY, CALIFORNIA.

By Alice Eastwood.

Erigeron angustatus Greene and *Erigeron petrophilus* Greene are both found on Mt. Tamalpais. The former is abundant on the trail leading down to the Potrero, the West Point Trail and the Bootjack Trail. The latter grows on the rocks along the steep trail that leads to the spring not far from the summit of the East Peak. These bloom during the summer.

Pentachæta bellidiflora Greene has been found by Miss Margaret Adamson covering the hills above Larkspur. In Greene's Manual of the Botany of the Bay Region this species is said to be rare.

Rhododendron Californicum is on Mt. Tamalpais. In Greene's Manual of Botany of the Bay Region, this species is not included. There are, however, some localities on Mt. Tamalpais where it is quite abundant and where it can be found in bloom during May. On the ridge separating Mill Valley from Sequoia Cañon, the little gulches on the eastern exposure are gay with the blooming bushes. They can be plainly seen from the summit of the ridge on the

Throckmorton Trail and a few are quite accessible. It has also been reported from near Corte Madera by Miss Belle Brown, (Zoe, ii. 77); Miss M. E. Parsons, also, has found it there. It was recently seen in the Blithdale Ravine by Mrs. M. L. O'Neil. The little boys at Mill Valley who sell bunches of it to the Sunday visitors probably know of other localities.

Rhododendron occidentale can probably be found in bloom on the hills of Marin County during every month of the year. There are two places where it was frequently seen by the writer during the past November, December, January, February, and March. One is on the trail to the head of the Big Carson on the hills back of Fairfax, the other a spot on the Boot-jack Trail. During the winter the flowers appear on the dry leafless branches, reminding one of the legendary flowering of St. Joseph's Lily. Sometimes they are surrounded by brilliant scarlet leaves which persist into the winter. It is most attractive, then, and always suggests old age with a youthful heart. My record shows it to have been observed in bloom on the following days: Nov. 21, Nov. 28, Dec. 5, Dec. 12, Dec. 26, Jan. 16, Feb. 26, March 13.

Pyrola aphylla has been seen by the writer in Cataract Gulch, west fork of Sequoia Cañon and near Mason's Camp on Lagunitas Creek. It is rare and only one or two plants have been noted in each locality.

Cornus Nuttallii has been vaguely reported from Marin County; but so far as known, no record of any definite locality, no collection of specimens has ever been made from that county. On May 1, while on a tramp over Mt. Tamalpais from Rock Spring to the foot of Cataract Gulch, it was seen by the writer for the first time, in all the glory of its mantle of snowy flowers. It was a sight never to be forgotten, forever inspiring and uplifting in remembrance. The tree grows along the banks of the stream that further down tumbles over precipitous rocks, through the most picturesque cañon on the mountain, forming the main branch of Lagunitas Creek.

It was no mean specimen but a tree probably fifty feet in height with a slender trunk about six feet from the ground to the lowest branches. The tree was a canopy of flowers, marvelous and startling to look upon. The individual clusters ranged from five to eight

inches in diameter and each branch was laden. The spot chosen for its home is most romantic. Near by lies the wreck of an old cabin, its walls and roof upon the ground; a little stream full of watercress, fed from a never-failing spring on the hill above, trickles down into the creek at its feet; its nearest neighbor is one of the noblest trees on the mountain, a giant specimen of *Quercus agrifolia* with an immense moss-covered trunk and widely-spreading branches. The spot is well worth a journey to see even without the presence of its most beautiful object. Dr. Behr records this species as formerly growing in San Francisco and as rare on Bolinas Ridge (ERYTHEA iv., 170). According to his recollection a single tree was seen in a branch of Cataract Gulch, entering from the west, south of an old dairy ranch, at present uninhabited but visible from the trail leading from Rock Spring to Larsen's. An exploration of all the gulches near the old ranch, coupled with a report of my exploration to Dr. Behr, convinces me that the two trees are identical and that probably this locality is the only one on the mountain where *Cornus Nuttallii* grows. However, as many gulches on Mt. Tamalpais have never been explored, it may yet be found by some botanist who will penetrate the brush that clothes the hillsides leading into these cañons. It is interesting to note, while writing of this species, that according to Dr. Behr, the former representatives in San Francisco never became trees. They grew in some swampy or springy ground situated about where the building of the California Academy of Sciences now stands.

Astragalus Breweri Gray is quite common in the neighborhood of Rock Spring on Mt. Tamalpais; in bloom in April.

Vicia Californica Greene, grows on the road between Fairfax and Cataract Gulch. It is found under the trees in one or two places. It differs somewhat in the shape of the leaflets from the typical form of the Sierras; but the difference seems scarcely sufficient to constitute even a variety. The leaflets are rounded at base instead of cuneate.

Cheilanthes myriophylla was seen recently near the Boot-jack Trail not far from Berg's Camp.

Cheilanthes Californica, so common in Southern California, has long been known in Marin County from a single locality. This is on rocks facing westward, near the head of one of the main branches of Sequoia Cañon on Mt. Tamalpais. In February of this year, I found it quite abundant on the rocks at the falls where the Little Carson Creek heads. These rocks faced the northwest, and the Cheilanthes grew where the soil of the hillside met the rocks and also in the crevices of the rocks. In this locality and along the creek below are to be found almost all the ferns credited to Marin County. *Cheilanthes myriophylla* grew in the crevices of the same rocks where *Cheilanthes Californica* flourished, and near by were *Pellæa densa*, *Pellæa Ornithopus*, *Pellæa andromedæfolia*, *Gymnogramme triangularis*, *Adiantum emarginatum*, and *Polypodium vulgare*. In the cañon below were the ferns always found in such places, as *Woodwardia radicans*, *Asplenium Filix-fœmina*, *Aspidium munitum*, *Aspidium rigidum*, *Pteris aquilina* and *Adiantum pedatum*.

SHORT ARTICLES.

Is XEROPHYLLUM TENAX A SEPTENNIAL?—There is a popular belief that this plant is a septennial. My experience leads me to think that there is a basis of truth underlying the belief. I know positively that this species was in bloom on Mount Tamalpais, Marin County, California, early in May, 1891, and I have a specimen then given me by Mrs. Brandegee. During the last five years scarcely a month has passed that I have not been over the mountain in localities where the *Xerophyllum* was abundant and I have always been on the lookout for the blooming plants.

On May 1st of this year my long search was rewarded. From the summit of the ridge, on the Throckmorton Trail, I saw the tall spikes of creamy flowers growing where the railroad camp was situated during the building of the road. Others have reported it from Mill Valley and as visible from the Mount Tamalpais train elsewhere; so it must be in bloom quite extensively on the mountain. It is almost exactly seven years to a day since my first knowledge of the plant in bloom, and during the interval I have neither seen

nor heard of its flowers. Dr. Behr remembers that it was in bloom in 1884, having verified his recollection by a reference to some old letters.

There are many plants now growing on the mountain that show no sign of a scape; so all the plants can not be in bloom at once. It will be interesting to note whether or not these bloom next year. Mrs. Brandegee remembers having seen it in two successive years, and there is a specimen of a small plant collected by her on Mt. Tamalpais in 1892, in the Herbarium of the California Academy of Sciences. Miss H. A. Spaulding, also, remembers having seen it in two successive years in the Santa Cruz Mountains; but the second year the specimens were fewer and smaller.

Dr. Behr, in his Flora of the Vicinity of San Francisco, writes as follows concerning this species:—

"This plant is remarkable by its flowering plentifully at certain years and then disappearing altogether for a long period. This circumstance is probably owing to the fact that the plant requires a fixed age before flowering and then dies after having ripened its seeds. We find the same peculiarity in many species of bamboo, in some palms, viz., *Corypha* and in *Agave*, all of which plants are annuals in a botanical sense, but require a number of years to complete their biological cycle."

During this year and the next, a careful observation of the plants on the mountain ought to settle, to some extent, the doubt concerning their length of life and time of blooming. It may be, however, that some peculiarity of atmospheric or other environment during certain years will stimulate these plants to bloom and that their apparent periodicity is only a coincidence.—ALICE EASTWOOD.

Xerophyllum tenax occurs, also, on Howell Mountain, Napa County, California. The country people of that vicinity have had their attention attracted to the plant, since it fruits "only once in five years." There is a specimen of this species in the University Herbarium from Cascade Tunnel, Northern Pacific Railroad, Washington, 3,300 feet altitude, 1897, communicated by Prof. W. A. Setchell with the note "blooms annually."—ED.

NOTES ON WEST-AMERICAN CONIFERÆ.—VIII.

By J. G. Lemmon.

Pinus tenuis.

Small, slender trees, rarely exceeding 60 ft. in height, with a diameter of 2 feet; bark dark, quite thin, the outer, hardened epidermis ½–¾ inch thick, and coarsely checked; cones very small, declined, ovate, slightly oblique, ½–1¼ inch long, the scales on the outer side and near the base more developed than the rest; prickles minute, stiff and incurved; seeds ovate-acute, 1½–2½ millimeters long, light yellow, mottled with brown on the upper side, brown and longitudinally furrowed below; seed-wings semi-elliptical, 8–10 millimeters long, including the clip holding the seed, diaphanous; leaves in pairs 4–6 centimeters long, 1½–2 millimeters wide, obscurely serrulate near the apex; male flowers small, numerous in a dense cluster.

High plateaux and mountain-sides and along stream banks of northern regions from the interior of Alaska and British Columbia, southward along the Rocky Mountains, through Montana and Wyoming, thence westward through Idaho to the Blue Mountains of northeastern Oregon. Muir, Gorman, Johnson, Piper, Henderson, Smith, Langille, Lemmon, Lloyd and other collectors. Distinguished as a slender tree with very small cones, inhabiting a distinct northern region; usually crowded into dense groves; the cones usually remaining for many years on the limbs, often aggregated near the ends. Owing to the slender and limbless character of this pine and its abundance in certain localities, it is very serviceable in primitive house-building, fence-making, etc., hence properly called "Lodge-pole Pine."

This form of pine has been confounded with another of the Thimble-cone group, the Scrub Pine (*Pinus contorta* Loud.), a storm-beaten tree of the immediate coast from Mendocino City to the islands of Alaska, with irregular, mostly cylindrical cones, and short, stiff leaves; and also, with another of the same class, the Tamarack Pine (*P. Murrayana*, "Oreg. Com."), a thick-trunked

but very thin-barked tree, which is larger in all its parts and which inhabits sub-alpine regions to the southward of the present species.

Tsuga Hookeriana Carrière.*

Small alpine trees, abruptly spire-shaped or depressed, seldom exceeding 30 feet in height and a diameter of 10 to 15 inches; branches erect or spreading; branchlets usually erect, but often spreading; cones produced at the ends of the branchlets in the same direction, on short, stout peduncles, hence not always pendant narrowly elliptical, 1½–2 inches long, purple until mature, then light brown; cone scales firm, convex, obovate, striated externally, expanded but not reflexed at maturity; bracts dark brown, shining, broadly ovate, denticulate above, and acute; seeds brown, 2½–3 millimeters long, bearing resin vesicles on the lower surface; wing, including the part inclosing the seed, elliptical, 5–7 millimeters long, concave, light yellow, translucent, not veined with brown lines; leaves 2–3 centimeters long, not distichous but nearly tufted, mostly on the ends of short spurs, dark green with lines of stomata on both sides, convex on lower side, keeled on the upper; resin duct solitary dorsal and large; male flowers in a globose head, exserted on a filiform stipe 4–6 millimeters long, from a small bud; anthers apiculate, pollen bilobed.

Highest peaks of Alaska and British Columbia, southward along the Cascade Range and Rocky Mountains to Washington and Montana. Gorman, Piper, Johnson, Lloyd, Van Trump, Lemmon and others.

This interesting Alpine Hemlock is particularly distinguished by its very small size, the strictly alpine habitat, rounded or prostrate form, and its mostly erect branchlets and cones, the latter small, the scales not reflexed at maturity, the small leaves mostly in tufts,—all these characters strengthening the position once taken by the writer, separating these peculiar western spruces from the Hemlocks under the name of *Hesperopeuce*.† If that

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* *Tsuga Pattoniana*, variety *Hookeriana* Lemmon. Hand-book of West-American Cone-bearers, 54, 1895.

† Lemmon, in 3d Bien. Rep. Cal. State. Bd. Forestry, 111–126, 1890.

generic distinction is maintained, as it is likely to be, by progressive botanists, this newly-described species may be referred to as *Hesperopeuce Hookeriana*.

This alpine tree, suspected to be the type of a distinct species when first discovered by Murray in 1855,* has been confounded with the vastly larger trees of the very different sub-alpine Patton Hemlock (*Tsuga Pattonii* Engelm) of the southern mountains from the Cascade Range of Oregon, southward along the Sierra Nevada to Southern California. I take particular pleasure by the aid of added characters in restoring the tree to the rank of a species as was done by Carriere.†

In this connection it is interesting to note that the "Oregon Committee" first published (in an obscure circular in 1852) our southernmost species under the name of *Abies Pattonii*, so this spelling of the specific name of the Patton Hemlock must be adopted.

REVIEWS AND CRITICISMS.

L'Algérie; le sol et les habitants; Flore, Faune, Géologie, Anthropologie, Resources Agricoles & Économiques. Par Professeurs J. A. BATTANDIER et N. L. TRABUT [Paris; Baillière & Fils, 1898, 3.50 francs].

This little book gives us a very complete idea of the climate and natural history of Algeria, in the small compass of 360 pages. It does not attempt a complete list of the native plants known to occur in the region, but wisely enumerates only those genera or species which help to give a marked and characteristic feature to the landscape.

The climatic conditions divide the flora into three zones: 1st, that of the Mediterranean littoral, known as the Tel, characterized by evergreen trees and shrubs, various oaks, the olive, etc.; by an annual, herbaceous spring flora, which is at its best in April and

* *Abies Hookeriana*, in Edinb. New Phil. Journ., new series, 289, t. 9, f. 11–17, 1855.

† *Tsuga Hookeriana*, in Trait. Conif. nouv. ed. 252, 1867.

May, like that of middle California; and by the large number of its bulbous plants: 2d, that of the steppes or vast plateaux, 3,000 to 3,500 ft. in altitude, which divide the Tel from the Sahara, covered with a dense growth of either Artemisia herba-alba or Stipa tenacissima, amongst which are found scattered growths of various other plants indicative of comparatively high altitudes —Linums, Helianthemums, Scabious, Nigellas, Erysimum grandiflorum, Allium tauricum, Sedum altissimum, etc.: 3d, the arid, sandy Sahara, with its characteristic ammophilous plants, Aristidas, some Acacias, Prosopis, Herniarias, Polycarpæas, Scleroccphalus, Genista Saharæ, Tamarisc, Ephedra, Calligonum comosum, Salsola spinescens, and many other Salsolaceæ, etc., etc.

The close affinity between the flora of the Algerian Tel and that of southeastern Europe is noticed. So close is this affinity, the authors tell us, that one would have to travel 100 leagues north of Montpellier or south of Algiers before finding any material difference; they raise the question whether this peculiar flora is that of a natural region into which the Mediterranean Sea intruded after its establishment or whether the equable climate due to the waters of the Mediterranean is the cause of the distinctive flora.

The seasons and climate in Algeria appear to coincide almost exactly with those of California; but apparently there is but little real affinity between the floras of the two regions.* One of the striking features of the Algerian flora, and one in which it differs greatly from that of California, is the flowering of many bulbous plants (Urginea, Colchicum, Cyclamen, Leucoium, Scilla, Narcissus, etc.) with the advent of the first showers of the rainy season, in September or October.

The flora is represented by some 3,000 species, of which about 600 are peculiar to the region. The families producing the largest number of species are the Compositæ, Leguminosæ, and Gramineæ.

It is to be regretted that the authors should have seen fit to give the French popular names of plants without at the same time placing their scientific equivalents alongside. The French names

*About 113 Dicotyledonous genera are represented in both Algeria and California, but they are all genera of naturally wide distribution. Algeria has 44 species of Trifolium, 43 Astragalus, 18 Lotus, 15 Artemisia, 13 Atriplex, 9 Delphinium, 8 Quercus (and 4 named hybrids), and 7 Lupinus.

are not always familiar to foreign ears, nor are they always to be found in the dictionaries. We in America are by no means wholly free from a similar error, but are apt not to notice it until it is perpetrated in a foreign language.

It is to be hoped that this highly interesting and instructive book will prove the forerunner of many like it, whose appearance cannot but stimulate and aid the study of geographical and ecological botany.—J. BURTT DAVY.

NEWS NOTES AND CURRENT COMMENT.

THE fiftieth anniversary of the American Association for the Advancement of Science will be celebrated at the annual meeting in Boston, August 22 to 27.

WE ARE happy to learn that an illustrated monograph of the Californian Hepaticæ, which M. A. Howe has had in preparation for several years past, is now approaching completion. The author of this paper is a graduate student at Columbia University, and has lately received from that institution the degree of Doctor of Philosophy, his dissertation upon the Californian Hepaticæ being accepted as a thesis.

AT THE May commencement of the University of California, graduate degrees in botany were conferred upon four students: The degree of Master of Science upon F. T. Bioletti (Thesis: Notes on the Genus Nemophila); C. P. Nott (Thesis: The Classification and Distribution of the Species of Nitophyllum Grev. occurring on the Coast of California); and Clara L. Williams (Thesis: The Origin of the Karyokinetic Spindle in Passiflora cerulæa): The Degree of Doctor of Philosophy upon Willis L. Jepson (Thesis: A Flora of Western Middle California).

AMONG recent changes in the botanical staffs of American universities we have to note that Prof. C. R. Barnes of the University of Wisconsin has been appointed Professor of Physiology in the Department of Botany at the University of Chicago. Dr. R. A. Harper of Lake Forest University succeeds Prof. Barnes at Wisconsin.

DURING the last two years the natural vegetation of alkali lands in California has been the subject of inquiry by the College of Agriculture of the University of California, and some preliminary field observations and results of investigations appear in a paper in the Report for the years 1895–7. In this paper Mr. J. B. Davy tells us that at least 197 native Californian species are restricted to alkali soils. In the Kern and Tulare Regions he finds the most characteristic species to be the following: *Sesuvium portulacastrum, Tissa spp., Salicornia sp., Suæda Torreyana, Kochia Californica, Allenrolfea occidentalis, Anemopsis Californica, Nitrophila occidentalis, Centromadia pungens, Bigelovia veneta, Atriplex sp., Frankenia grandiflora campestris, Sporobolus airoides* and *asperifolius*, and *Distichlis spicata.*

BULLETIN No. 20 of the Division of Botany of the Department of Agriculture deals with the "Principal Poisonous Plants of the United States." The author of this report is Mr. V. K. Chesnut who has in preparation a manual of our native poisonous plants. In this bulletin only the most common or well-known species are listed, but rather full information is set down concerning the botanical character of the plant, its habitat, its poisonous constituents, causes of poisoning, symptoms and remedies, besides historical notes and short descriptions of allied species. *Delphinium Geyeri* of the Rocky Mountain region and *D. Menziesii* of the Northwest are named as notoriously poisonous in the regions which they inhabit; and *D. recurvatum* is said to be fatal to animals in San Luis Obispo County, California.

Mr. Chesnut spent the month of July of this year in field work in the Round Valley region. He is in charge of the investigations on poisonous plants and solicits correspondence with local botanists, mail franks for the forwarding of specimens being furnished to those who desire them.

MR. C. R. DODGE is the author of "A Descriptive Catalogue of the Useful Fibre Plants of the World," which has been in preparation something over twenty years. The work is issued by the U. S. Department of Agriculture, of which Mr. Dodge is special agent. Each plant is described under its Latin name, the arrangement being alphabetical, with cross-reference from the common to the

scientific name. The volume of 361 pages is of an encyclopedic character and will be of importance to all students of economic botany. Numerous cuts are scattered through the text, and there are, in addition, twenty-five photogravure illustrations.

THE Engelmann Botanical Club is a new society at St. Louis of which Dr. Trelease, of the Missouri Botanical Garden, is president, and Hermann Von Schrenk is secretary. Its organization dates from December, 1897.

IN THE January number of the London *Journal of Botany* Mr. Britten writes of one Mr. H. E. Brown, of Chico, California, who has issued "a remarkable list of his collections." We have not been able to procure a copy of this document, but Mr. Britten's quotations show the author to be alike innocent of botany, Latin, or any similar accomplishment. The editor of the *Journal* slyly hazards the guess that this list "embodies the latest American researches into nomenclature," but the gap between this list and some others is, perhaps, not so much of the nature of a chasm after all. It may be added that the collector sells his specimens for "3 cents each or less." The cheapness of his specimens and the character of his nomenclature certainly reveal a degree of correspondence.

THE ANNUAL REPORT of the Field Columbian Museum (of Chicago) for the years 1896–7 illustrates graphically the method of arranging the specimens of North American Forest Trees in that institution. The representation of each species includes a framed tray, containing a branch, flowers, and fruits, and a block of wood from the same tree; a photograph of the tree in summer, and another of the same tree in winter; a seven-foot trunk, a transverse section, and a commercial plank; a map of North America colored to show the distribution of the species; and a series of ornamental cabinet specimens of the wood. Such a collation involves a great amount of labor and expense, but will result in a most instructive series.

IN connection with its agricultural extension work, the Cornell University experiment station is issuing teachers' leaflets on nature study for use in the common schools of New York. One of the

best of these is "How a Squash Plant Gets out of the Seed," by L. H. Bailey. Some of the other titles run like this: "Four Apple Twigs," "A Children's Garden," "The Leaves and Acorns of our Common Oaks." The drawings are of a good character, but in "The Life History of a Toad" the artist has taken to the Aubrey Beardsley type of illustration, which looks a trifle curious, and would seem ill-advised in a nature-study lesson.

THE LEGISLATURE of the state of New York has made a generous appropriation to Cornell University for the foundation of a College of Forestry. The Cornell Board of Trustees has chosen Dr. B. E. Fernow, chief of the Division of Forestry, U. S. Department of Agriculture, to be Director of the new college.

DR. D. MORRIS, the Assistant Director of Kew Gardens, has been appointed to the important position of Imperial Commissioner of Agriculture for the British West Indies. This office has recently been created with a view to relieving the agricultural depression in these naturally fertile islands, which is largely due to ignorance of the principles of agriculture and of the needs of the world's markets. It is no exaggeration to say that no better man could have been chosen for the post. Dr. Morris was for some years prior to joining the Kew staff, Director of Public Gardens and Plantations in Jamaica, and in that capacity made himself conversant with the peculiar needs and difficulties of the British West Indies. While at Kew, his attention has been largely devoted to Economic Botany and Agriculture, and he has in this way been brought in touch not only with botanists and agriculturists from all parts of the globe, but also with progressive merchants and manufacturers; thus he has become familiar with the climatic conditions and agricultural products of all the British possessions in the tropics, and with the relation between supply and demand of the leading plant products—qualifications of the utmost importance in this new sphere.—B. J. D.

NEW OR LITTLE-KNOWN PLANTS OF SOUTHERN CALIFORNIA.—I.

By S. B. Parish.

Selaginella Bigelovii Underwood, Bull. Torr. Club, xxv. 130. This is the common Selaginella of the intra-montane region of Southern California, abundant on dry soil, usually in the shelter of shrubs or stones, or on shaded banks, throughout the hill region, and ascending the mountains to 7,000 ft. alt. The prostrate Selaginella (1,200, *Parish*) noted by Dr. Underwood (l. c. 133), is a plant of the lower altitudes of the desert region. It occurs on the bases of boulders at Palm Springs and Whitewater, at 500–1,200 ft. alt. A third form was observed last June at Toy's Ranch, in Sycamore Cañon, near Poway, San Diego County. This has slender, thread-like stems, creeping on hard clay banks. It is very distinct in appearance, and can hardly be placed in any of the species of Dr. Underwood's revision. Unfortunately it was so dry and brittle that no specimens were secured, and it is mentioned to direct the attention of other collectors to it.

Sparganium simplex angustifolium Engelm; Gray, Man. 5th ed. 481. Bluff Lake, at 7,400 ft. alt., in the San Bernardino Mountains, *Miss Nora Pettibone.*

Potamogeton lucens Linn. Sp. Pl. 126. In pools in the dry bed of Penasquitas Creek, San Diego County, June, 1897.

Monerma subulata Beauv. Abundant above high-water mark, around the borders of the first laguna south of Oceanside, and sparingly by a desiccated pool on the neighboring mesa, June, 1897. Known heretofore from the Mediterranean, South Africa and Australia. The plant was identified by Dr. Beal.

Avena barbata Linn. Although it is only within recent years* that this species has been reported from California it has evidently been established, at least in the southern counties, from very early times, but has been confused with *A. fatua*, and it is

* First by Vasey, Descrip. Cat. Grasses U. S. 56 (1885). See also Dewey, Eryth. v. 29; McClatchie, Eryth. ii. 78.

probable that many specimens in herbaria under the latter name will be found really to belong in this species. Both occur throughout the intra-montane region. In San Bernardino and Riverside Counties *A. fatua* is the more common, but in many parts of San Diego County (Santa Ysabel, Julian, Pensaquitas Ranch, Poway, etc.) *A. barbata* is much the more abundant, and often over large areas the exclusive species. In the field the two species may be easily recognized at sight. *A. barbata* is tall (1–8 ft.), slender, flexuous, green, with a diffuse open panicle, and slender, pointed florets. *A. fatua* is stouter, glaucous, more rigid, and has a usually smaller and more compact panicle, and broader and blunter florets.

AVENA FATUA GLABRESCENS Coss. This does not differ in aspect from the species, so that it may easily be mistaken for it, unless the florets are examined, when they will be found to be clothed with hairs only on the rachilla and at the base of the flowering glumes. The variety is probably widely distributed, but I have specimens only from Nordhoff, *F. W. Hubby*, and of my own collecting at San Bernardino.

CAREX VICARIA Bailey. Bear Valley, 6,500 ft. alt., in the San Bernardino Mountains, June, 1896. Identified by Dr. Bailey.

JUNCUS NEVADENSIS Watson, Proc. Am. Acad. xiv. 303. In mountain meadows at 6,000–8,000 ft. alt. in the San Bernardino Mountains. Talmadge's Mill; Bear Valley; Bluff Lake. A form of this species has been distributed by me as *J. aseptus* Engelm. ined.

JUNCUS ORTHOPHYLLUS Coville, Death Val. Rep. 207. In the San Bernardino Mountains at 6,500–8,000 ft. alt., in meadows and by streams, forming a sod. Bear Valley; Bluff Lake. Exhibits a considerable range of variation in the width of the leaves.

JUNCUS OXYMERIS Engelm. Trans. St. Louis Acad. ii. 483. San Bernardino Mountains at Talmadge's Mill, alt. 5,000 ft.

IRIS HARTWEGI Baker, var. **australis.** Root-stock slender; stems distant, or few-clustered; leaves 3–4 lines wide, the lowest somewhat exceeding the stems, these about one foot high, leafy; bracts distant; flowers 1–3, light blue with darker veins; tube short; outer segments 2½ inches long, the ovate blade nearly 1 inch wide, narrowed into a wide claw; inner segments nearly as

long, lanceolate-linear; anthers ¾ inch long, on nearly as long filaments; styles with divergent foliaceous crests ½ inch long; capsule 1 inch high, oblong, obtusely 3-angled; seeds cubical or angled, flattened, wrinkled.

Common in dry soil in the Nevadan region, notably in open coniferous forests, at 5,000–6,000 ft. alt. Cuyamaca, San Jacinto (*H. M. Hall*), San Bernardino and Cucamonga Mountains. Flowering in June to July. This plant has been distributed by me under Professor Foster's manuscript name of *I. Parishii*, but it seems better disposed of as a variety of *I. Hartwegi*, from which it differs in its broader outer segments, with claws, and larger crests, but agrees in habit, capsule, and especially in seed character.

ERIOGONUM WRIGHTII **taxifolium**. *E. taxifolium* Greene, Pitt. i. 267; ii. 295. Spencer Valley, San Diego Co., *R. D. Alderson*. Eastern base of Grayback Mt., in Whitewater Cañon. A shrub, 2–3 feet high, with slender tomentose branches.

OXYRIA DIGYNA Camptdera, Rumex, 155. Summit of San Jacinto Mountain, *H. M. Hall*, Aug., 1897.

POLYGONUM PARRYI Greene, Bull. Torr. Club, VIII. 99. Border of the Reservoir, Cuyamaca Mountains, June, 1897.

ROUBIEVA MULTIFIDA, Moq. Ann. Sci. Nat. II. 1, 293, t. 10. Compton, Los Angeles Co., *McClatchie*, 1896.

Salicornia subterminalis. From running roots-stocks, apparently herbaceous, compact, 1 foot high; spikes 1–2 inches long, of 3–5 enlarged fertile bracts, terminated by 5–10 slender, infertile ones, these sometimes with pairs of lateral branches of 2–3 bracts; utricle and seed smooth.

In strongly alkaline soil, flooded in winter, but becoming dry in summer, along the San Jacinto River, Riverside Co., June, 1882 (1520 *Parish*), Menifee (4463 *Parish*), and Perris, June, 1897.

Eriogonum Bloomeri. *Virgatæ;* perennial, with leafy caudex; leaves densely white-tomentose, oval, ovate or obovate; scapiform peduncles numerous, foot high, erect, repeatedly di- and trichotomously branched; lower bracts foliaceous; involucres distant, 2 lines high, teeth subacute, few (3–15) flowered; flowers 4 lines high, attenuate at base, glabrous, yellowish; filament hairy at base; achene glabrous, 2 lines long, attenuate above.

In dry soil in the Nevadan region at 4,000–7,000 ft. alt. San

Bernardino Mountains, 1664 and 3785 *Parish*, types, (distributed as *E. saxatile Bloomeri* Wats. MS.). San Gabriel Mountains, above Pasadena, *McClatchie;* Rock Creek, *Davidson;* Acton, *Hasse.* San Jacinto Mountains, *Parish.* Flowering in July to August. Near *E. saxatile* Watson, from which it differs in its erect, much-branched panicle, distant and few-flowered involucres, and larger and more attenuate flowers.

ISOMERIS ARBOREA GLOBOSA Coville, Proc. Biol. Soc. Wash. ii. 73. Common on the coasts of San Diego County. Carlsbad (at the railway station); Oceanside. The only character which appears to hold is the globose form of the capsule.

COTYLEDON VISCIDA Wats. Proc. Am. Acad. xvii. 372. Abundant on the precipitous rocky bluffs of the southern bank of San Luis Rey River, not far above the railway bridge, and thence a mile or more inland, at Oceanside, San Diego Co., June, 1897. Fruit collected at San Juan Capistrano Hot Springs in 1881, by Nevin, apparently not met with since.

POTERIUM ANNUUM Nutt.; Hook. Fl. Bor. Am. i. 198. In dry soil, at the Reservoir, in the Cuyamaca Mountains.

ROSA CALIFORNICA Cham. & Schl. var. **glabrata**. Entirely glabrous, except the inside of the calyx lobes, not glandular; stems slender, prickles approximate, slender, straight, or nearly so; leaves on mature wood crowded, leaflets 3–5, half to three-fourths inch long, on young shoots more distant, leaflets about 7, inch or less long; corymbs 1–3 flowered, flowers less than inch in diameter.

On the desert side of the San Bernardino Mountain, near water, Cushenberry Spring, alt. 4,000 ft., 1 June, 1892, 2481 *Parish.* Types in Hb. Gray & Hb. Parish. This is the plant mentioned by Watson in Proc. Am. Acad. xx. 344. Dr. Davidson's Rock Creek specimen, reported as *R. gymnocarpa* in Plants of Los Angeles County, 9, probably belongs here.

LUPINUS GRACILIS Agardh, Syn. 15, t. 1. Witch Creek, San Diego Co., *Alderson;* San Jacinto, Riverside Co., *McClatchie.*

LATHYRUS ALEFELDI T. G. White, Bull. Torr. Club, xxi. 449. Clambering over bushes on hillsides throughout San Diego County at 200–5,500 ft. alt. Lakeside, *Hubby;* Fallbrook; Pala; Smith

Mt.; Cuyamaca Mt.; Descanso. Apparently not extending inland beyond the summit of the Coast Mountains. Flowers in May and June, and sparingly in autumn.

LATHYRUS LAETIFLORUS Greene, Eryth. i. 105. Clambering over shrubs; common on mesas and hills along the intra-montane base of the San Bernardino and San Gabriel Mountains below 3,000 ft. alt. Pasadena, *McClatchie;* San Bernardino. Flowers in March to May; strictly vernal; the stems dying down to the perennial root after fruiting.

VIOLA LOBATA INTEGRIFOLIA Wats.; Brew. & Wats. Bot. Cal. i. 57. Growing in small basins on the mountain-sides in coniferous forests near the Stonewall Mine in the Cuyamaca Mts. With the species, and more abundant than it. Some specimens show lobate, entire and transitional leaves on the same plant.

EULOBUS CALIFORNICUS Nutt.; Torr. & Gray, Fl. i. 514. The radical leaves of this plant form a prostrate rosette at the base of the stem, and are 6–8 inches long, lanceolate, and runcinately pinnatifid. They are formed early in the season and disappear before the plant begins to flower.

Sphaerostigma rutila. *Œnothera rutila* Davidson, Eryth. ii. 62. Big Rock Creek, on the borders of the Mojave Desert, July, 1893, *Dr. A. Davidson.*

APHYLLON SP. A single specimen, consisting of a short stem bearing only one flower, the whole hardly an inch long, of a peculiar Aphyllon, was found growing on the root of a plant of *Coldenia Palmeri* collected in the street near the church at Palm Springs. It is evidently an undescribed species, but the material is too scanty for characterization, and the attention of collectors visiting Palm Springs is called to the desirability of obtaining further specimens.

EUSTOMA SILENIFOLIUM Salisb. Parad. Lond. t. 34. Even in as recent works as Coulter's Manual of the Phanerogams and Pteridophytes of Western Texas, and Britton and Brown's Illustrated Flora, Eustoma is defined as a genus of *annual* herbs. The perennial character of the Californian species has already

been noted by Dr. Gray in the supplement to the Synoptical Flora. The innovations are by buds appearing in early spring at the base of the old stem.

PHILIBERTIA LINEARIS HIRTELLA Gray, Syn. Fl. ii. 1. 88. In cañons at Palm Springs in the Colorado Desert, March, 1896. Growing with the variety *heterophylla*, but much less abundant; equally climbing, and differing only in its dense pubescence.

GILIA TENUIFLORA Benth. var. **altissima**. One to three ft. high, much branched; branches of the inflorescence beset with tack-glands; corolla 1 inch long, lilac, with darker throat; capsule oblong.

Common in the foot-hills near San Bernardino: Cañon Diablo; Waterman Cañon, etc. Flowers in May to July.

GILIA TRICOLOR Benth. Hort. Trans. viii. t. 18. Antelope Valley, *Dr. Davidson, Miss Stevens.*

PHACELIA BRACHYLOBA Gray, Proc. Am. Acad. x. 324. *P. Orcuttiana* Gray, Proc. Am. Acad, xix. 88. *P. leucantha* Lemmon; in Greene, Pitt. i. 175. Common in damp, sandy soil, usually in cañons, or in washes, throughout the intra-montane region below 2,500 ft. alt. Pasadena, *McClatchie.* Los Angeles, *Davidson.* Newhall, *Hasse.* Del Mar, *Miss Angier* (type station of *P. leucantha*), Jacumba, *Cleveland.* Yucaipe; Santa Ana River and foot-hills near San Bernardino. In all the specimens I have examined the corolla is without appendages.

PHACELIA DAVIDSONII Gray, var. **macrantha**. Stem stout, assurgent or erect, foot or more long, corolla one-half inch or more high, dark purple, the white of the throat extending into the base of the limb.

San Bernardino Mountains at 5,000–6,000 ft. alt., rarely descending along streams to 1,000 ft. (Colton). Waterman Cañon, Long Point. The species has slender decumbent stems; corolla not over three lines high, lighter purple, only the throat white. The allied *P. Douglasii* has corresponding large and small flowered varieties.

PHACELIA TANACETIFOLIA Benth. Bot. Reg. t. 1696. Mouth of Rechi Cañon, near the Gage Canal, San Bernardino Valley, May, 1897. Apparently one of the rarest plants of our region, the single specimen above recorded being the only one I have seen. The

plants usually referred here in catalogues and herbaria are *P. distans* Benth. The present species may be recognized by its less diffuse stems, more coarsely dissected foliage and lighter blue flowers, and on examination by the wide appendages of the corolla, which are not present in *P. distans*.

NEMOPHILA MENZIESII Hook & Arn. var. **integrifolia**. Stems 6–8 inches long, prostrate; leaves 4–8 inches long, ovate or obovate, entire, or rarely 1–2 toothed, or lobed; corolla 6 lines wide, very light blue, or nearly white; calyx lobes equaling or surpassing the mature capsule, this ovoid, 3 lines high.

Open ground, head of Waterman Cañon, at 4,000 ft. alt. in the San Bernardino Mountains, June, 1889.

NEMOPHILA PARVIFLORA Dougl.; Benth. Linn. Tran. xvii. 275. San Diego, *Alderson*, 1895.

COLDENIA BREVICALYX Wats., Proc. Am. Acad. xxiv. 62. In dry sand, Palm Springs, April, 1882. Mr. Wright's No. 147 of 1880, type in part, was also from the Colorado Desert, probably from the above station, and not from San Bernardino, as erroneously stated by Dr. Watson.

This plant is a perennial from a stout, perpendicular, woody root; stems prostrate, repeatedly dichotomous, with a loose white epidermis, readily detachable at the nodes. The root character alone is sufficient to distinguish it from *C. Palmeri*, which has slender, horizontal running root-stocks.

Audibertia pachystachya. *A. incana pachystachya* Gray, Syn. Fl. ii. 1. 461. One to two feet high, woody at base only; leaves ovate or ovoid, 1–2 inches long, or the smaller obovate; inflorescence a dense terminal spike of approximate verticils, often with short lateral spikes from the axils of the upper leaves; bracts scarious, ovate or oblong, half inch long, purple, exceeding the flowers; then as in *A. incana*.

San Jacinto Mountain, *Hall*. Bear Valley and Holcomb Valley, in the San Bernardino Mts., at about 7,000 ft. alt. Flowers in August.

CASTILLEIA OBLONGIFOLIA Gray, Syn. Fl. ii. I. 296. Stonewall Mine, Cuyamaca Mountains, June, 1897.

CNICUS DRUMMONDII Gray, Proc. Am. Acad. x. 40. Meadows at Warner's Ranch, San Diego Co., June, 1897. Stems 1–2 ft. high.

HEMIZONELLA MINIMA Gray, Proc. Am. Acad. ix. 189. Mt. Wilson, near Pasadena, *McClatchie.*

BAERIA TENELLA Gray, Proc. Am. Acad. xix. 23. This rare plant, which has escaped the notice of botanists since the early collections of Gambel and of Parry, has been rediscovered this spring by Mr. Lewis A. Greata, near Los Angeles. Except in the pappus character the plant is precisely like *B. affinis* Gray, and it would not be surprising if the two were found to run together. Mr. Greata, however, who also finds *B. affinis* at the same station, has not been able to detect any intermediate forms.

HULSEA CALIFORNICA Torr. & Gray, Bot. Mex. Bound. 98. Near Nelly in Smith Mt., San Diego Co., *McClatchie, Parish.*

SOLIDAGO SPECIOSA Nutt. Gen. ii. 160. Bear Valley, *Davidson.* Bluff Lake, *Miss Pettibone.*

Chaenactis Orcuttiana. *C. tenuifolia Orcuttiana* Greene, West Am. Scientist, iii. 157. Cliffs facing the ocean, Encinitas; Oceanside.

SHORT ARTICLES.

SCIRPUS MARITIMUS COMPACTUS KOCH.—This variety appears not to have been hitherto recorded from the Pacific Slope. It grows along with the type at Rosedale near Bakersfield, Kern County, in a spot so strongly impregnated with alkali salts that a white efflorescence nearly two inches thick, covers it in the dry season. This locality is at least eighty miles from the nearest sea water.

Howell has collected it, also, "on tide lands north of the Umpqua River, Oregon," and I have found it along with the type in the salt marshes of San Francisco Bay, at West Berkeley. After nine months' cultivation in adobe soil, practically free from alkali salts, in the Botanic Garden at Berkeley, the Rosedale plant has flowered and produced seed, and maintains its varietal characteristics.

Flowers with both two and three stigmas, and with nutlets either plano-convex or compressed-trigonous, occur in the same spikelet in

our Pacific Coast specimens of *Scirpus maritimus* L. Syme states that the achenes are compressed-trigonous when there are three stigmas, and plano-convex when there are but two.—J. BURTT DAVY.

PYROLA MINOR L. IN CALIFORNIA.—In July, 1897, Miss Katherine E. Wilson collected this near East Lake in the high mountains of the Kings River country. This species has not before been recorded from California but it is not new to the Pacific Coast, being not uncommon from Oregon northward.—ALICE EASTWOOD.

PARASITISM OF ORTHOCARPUS PUSILLUS BENTH.—This plant, met with all the way from San Francisco and Oakland to Oregon, I have recently discovered to be parasitic on the roots of certain annual grasses and *Erodium cicutarium.* It probably has other hosts, also, and as of interest on this point a letter from a correspondent here follows.—J. BURTT DAVY.

You will find inclosed a branch of a weed [*Orthocarpus pusillus* Benth.] which has lately made its appearance in our valley lands, and it seems to take possession, and wherever it comes the grass disappears; but still it does not seem to grow thick enough to *choke* out the grass. . . . Many of our fields that have always been very productive of clover and also rye-grass, are being covered with this, and at a distance it looks like moss; it comes on fields that have been newly seeded as well as old pastures.—C. E. SPEAR.

Waddington, Humboldt County, Cal.
April, 1898.

OPEN LETTERS.

Bolander's Bladder Nut in Madera County, Sierra Nevada.

FRUITING specimens of *Staphylea Bolanderi* have recently been sent to the University of California Herbarium from Madera County. The recorded localities are few and the shrub is apparently a rare one. The following notes concerning the locality whence the specimens came are copied from the letter of the collector.

"Cascadel Ranch is forty-five miles from the post-office and corner grocery. The trees are so thick that one can scarcely look heavenward. The loneliness comes like a heavy pressure from all sides. People come to this region because Uncle Sam offers one hundred and sixty acres to old maids and widows and other citizens. . . . After a long stay Mr. P. went down the mountain one day and we rode with him about three miles. We swung our hammocks to some small trees that grew on a high bluff where we could see out over the world once more, there to await the return of the team at evening and look our fill for months to come. Across the gulch we saw some white flowers on a shrub and went to get them. The shrub was very graceful in shape, with gray bark, slender branches and white flowers in clusters on long greenish-white stems. The altitude was about 4,500 feet, with a southwest exposure, the ground moist but not wet. Seldom does one see such a sight as the shrub presents when in full bloom."—Mrs. L. A. R. Peckinpah, Cascadel Ranch, Madera Co., California.

NEWS NOTES AND CURRENT COMMENT.

MR. GIFFORD PINCHOT, who is well known as a forestry expert, has been appointed chief of the Division of Forestry, United States Department of Agriculture, to fill the vacancy caused by the resignation of Dr. Fernow.

Dr. FERDINAND COHN, Professor of Botany in the University of Breslau, Germany, died suddenly of heart disease, on June 25, at the age of 60. Dr. Cohn was known as the author of several botanical works, among them *Die Pflanze*, and was much interested in the study of bacteria and parasitic fungi. He was one of the fifty foreign members of the Linnean Society of London. —J. B. D.

THE DEATH is also announced of Dr. Johan Lange, Emeritus Professor of Botany in the University of Copenhagen, Denmark. Professor Lange was especially interested in systematic phanerogamic botany. He was a foreign member of the Linnean Society of London, and a Corresponding Member of the Académie Internationale de Géographie Botanique.—J. B. D.

MR. C. B. CLARKE, F. R. S., the well-known monographer of the Cyperaceæ of India and South Africa, has been elected a Corresponding Member of the Académie Internationale de Géographie Botanique, to fill the vacancy caused by the death of Professor Lange.—J. B. D.

A REVISION of the North American and Mexican species of Mimosa for the Synoptical Flora has recently been completed by Dr. B. L. Robinson, and appears in advance in the Proceedings of the American Academy (xxxiii. 305). The construction of a satisfactory key was attended with difficulties on account of the variation in the inflorescence which passes gradually from capitate to spicate, and in the number of leaflets, which is astonishingly inconstant upon the same individual; the spines, too, were found to be well developed or obsolete in plants which were in all other respects identical. The generic limits coincide with those laid down by Bentham. Sixty-seven species are described.

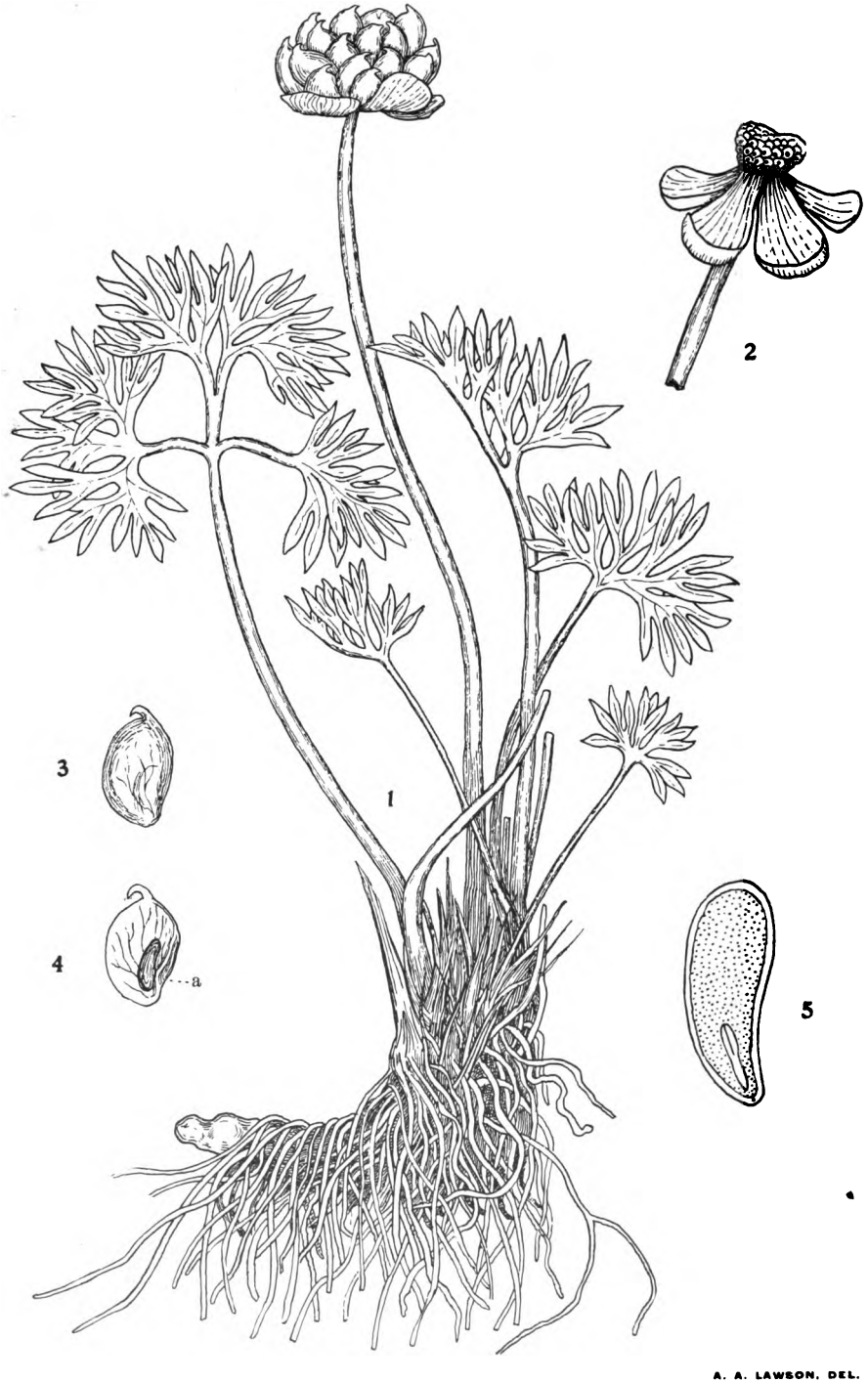
UNDER the title of "Studies in the Herbarium and Field," Miss Alice Eastwood begins a series of papers in the Proceedings of the California Academy of Sciences, No. 1 (i, ser. 3, 71) having been published Nov. 23, 1897. The most interesting part of the paper is an account of some spurless forms of Aquilegia from Colorado, which are well deserving of continued observation under cultivation. Three new varieties peculiar to the White Sands Region of New Mexico are named, described and figured, and also the following new species from California: *Iris Purdyi*, *Montia rosulata*, and *Newberrya subterranea*. The last named, in our opinion, can be homologized specifically with *Hemitomes pumilum* Greene, a curious root-parasite with subglobose body, which flowers and fruits beneath the surface of the ground. Miss Eastwood's plant, as the specific name would indicate, is also subterranean. A difference in the depth of seating of the plant body would readily account for the slight difference indicated in the color of the flowers, and as to the number of parts in the flower the sepals in *Hemitomes pumilum* may be either 4 or 3 or apparently even 2, and the petals 6, 5, or 4. In fact, the variation is quite analogous to that in *Boschniakia strobilacea*, a subterranean root-parasite of similar form. The author also describes three new manzanitas from Mt. Tamalpais, California, viz., *Arctostaphylos glandulosa*, *montana* and *canescens*, forms which

seem undescribed but which Miss Eastwood leaves "to the future monographer of the genus the task of assigning definite limits." Students of the Ericaceæ will, we are confident, unite in the hope that the recipient of the bequest may be none other than the author of this California Academy paper.

SOME of the less-known regions of New Mexico were the scene of field research by Mr. E. O. Wooton in the summer of 1897. The results of herbarium studies are now being published in the *Bulletin of the Torrey Club*, Prof. Greene diagnosing the new Compositæ in the March number, and Mr. Wooton himself describing new plants of other orders in the May, June, and August numbers (xxv. 257, 304, 451). Mr. Aven Nelson contributes to the pages of the same journal three papers on "New Plants of Wyoming" (April, May, July, xxv. 202, 275, 373). The title of Mr. Heller, "New Plants of Western North America," in the April and May numbers, is faulty in that the plants discussed are only in part new species. The literature relating to West America is also augmented in the January number by Dr. Small, under the title of "Studies in North American Polygonaceæ.—I," whose activity finds expression in the publication of twenty-two new species of Erigonum; further, Acanthoscyphus is a new genus founded on *Oxytheca Parishii*. The new species described by the same author, in the June number under the title, "Notes and Descriptions of North American Plants.—I," are all West American.

A STUDY of one of the type specimens of *Saxifraga fallax* Greene by Dr. John K. Small reveals seven teratological forms in the flowers, which he figures in the July *Bulletin of the Torrey Club* (vol. xxv. 391, pl. 343). Dr. Small does not say whether he has had the opportunity of studying the remaining specimens which constitute the type, but collectors would do well to examine plants growing in the original locality, that is, Summit Station, Sierra Nevada, California, where the species was collected July 26 by Prof. Greene on his journey eastward from California in the year 1895.

PROF. W. A. SETCHELL, under a U. S. Government commission, devoted the latter part of August to an investigation of the flora of the hot springs of the Yellowstone National Park. He returns to California in September.



A. A. LAWSON, DEL.

BECKWITHIA ANDERSONII (Gray).

BECKWITHIA, A NEW GENUS OF RANUNCULACEÆ.

By Willis L. Jepson.

Beckwithia. Acaulescent herbs, the scapes and divided leaves from perennial root stocks. Flowers large, solitary, terminating the naked scapes. Calyx regular, of five distinct sepals, persistent. Corolla not known. Receptacle globose. Pistils numerous, becoming large utricular flattened achenes. Seed elongated-linear, borne near the base of the ovary. Embryo slender, in the lower part of the seed, embedded in abundant endosperm.

B. Austinae. Low glabrous herb, the foliage somewhat glaucous. Root stock stoutish, 1 inch long or less, densely covered with fleshy-fibrous roots; scapes 2½ to 3 inches high, exceeding the leaves, sheathed at base (*i. e.*, below the surface of the ground) with the dark-brown persistent leaf-bases of previous seasons; leaves orbicular or cordate in outline, 1 to 1½ inches broad, 3 times ternately divided into oblong, acute, entire or sparingly-toothed segments; petioles 1 or 2 inches long; calyx ¾ to 1¼ inches in diameter; sepals orbicular or elliptic, ½ inch long, greenish, with many parallel nerves and with scarious margins; petals and stamens unknown; achenes follicle-like structures, with membranaceous pericarp, broadly obovate or elliptic, the ventral margin nearly straight, 5 lines long; style persistent, recurved, and hook-like; seed occupying but a small portion of the cavity, 2 lines long, anatropous, the hilum just above the slender base of the seed.

Collected by Mrs. R. M. Austin, who has for many years devoted her leisure to botanizing in northeastern California, and Mrs. C. C. Bruce, in decomposed lava on the western treeless slope of Lake City Pass, Modoc County, California, June, 1898. No. 2134. A single specimen in fruit was sent to the Herbarium of the University of California in the latter part of June, by Mrs. C. C. Bruce, and early in October the writer was favored with additional material in the shape of a full sheet of fruiting specimens.

When the plant, a single specimen, first came to us in June last,

Contributions from the Botanical Laboratories of the University of California, No. 1.

Erythea, Vol. VI, No. 10 [24 October, 1898].

its appearance suggested some Ranunculaceous genus not met with hitherto. A critical examination, however, aroused suspicion, and it was thought that the peculiar structures might chance to be abnormal. The task of recalling some West American plant that would match the vegetative parts of the specimen in hand did not prove to be an easy one. The scapes, the radical leaves, the cluster of fibrous roots clothing the short root stock, were, however, decidedly suggestive and it was finally compared with *Viola Beckwithii*.* The similarity between the two plants is certainly extraordinary. The plant here described as new could not match more closely in habit, in every vegetative feature, the species of violet just named. The leaves are divided in the same way; the petioles and scapes descend below the surface of the ground to the root stock in exactly the same fashion; the fibrous roots are clustered and identical in appearance. The differences are slight; the leaves in *Beckwithia Austinæ* are glabrous, in *Viola Beckwithii* hispidulose; in the former the leaf bases persist as a conspicuous sheath to the bases of the season's leaves and scapes. But after prolonged consideration the possibility of our plant being a teratological specimen of *Viola Beckwithii* was rejected. Such an hypothesis necessitated the supposition that the carpels of the gynœcium in that species had not only multiplied, but that the gynœcium itself had become apocarpous; that the sepals had not only enlarged but become regular.

The teratological theory at first conceived, therefore, does not, at the present time, seem reasonable to the writer. The material since received shows no variation, nor anything to suggest a monstrosity, except the fact that the structures are so unusual.

The affinities of this genus proposed as new are not easy to determine. In habit and external appearance Beckwithia suggests the genus Anemone, but it has no trace of the involucre, often so conspicuous in that genus and always so evident. Neither has it the fruit of Anemone. Lastly, the ovule is erect from near the base of the ovary and not pendulous. On the contrary, its receptacle may be likened in a general way to that of Anemone, and its habit recalls that of some sub-Alpine species of the latter genus. Technically it

* Lieutenant Beckwith, of one of the Pacific Railroad transcontinental exploring parties, in memory of whom this new genus of Ranunculaceæ is named.

may be rather near Pæonia; the leaves are divided and the flowers large and solitary as in that genus; the utricular fruit may be compared to the firm inflated pod of the Pæonies.

While the absence of specimens in anthesis precludes at this juncture an exhaustive discussion concerning the generic affinities of Beckwithia, its status as a genus can not, on account of the exceptional carpological structures and peculiar habit, be in the least affected by our lack of information on this point. The specimens of Mrs. Austin and Mrs. Bruce are excellent and show such remarkable characters that it is hoped that the paper, as now published, may so stimulate interest and inquiry concerning this exceedingly interesting genus that further knowledge may be forthcoming at no distant date.

Explanation of Plate I.

Fig. 1. Plant of *Beckwithia Austinæ*, natural size, the scape bearing a head of achenes.

Fig. 2. Upper portion of scape showing persistent sepals and the receptacle from which the achenes have fallen.

Fig. 3. Achene, natural size.

Fig. 4. Achene with one side of the pericarp removed, showing the attachment of the seed; the margins of the carpel are united along the lower portion of the ventral suture, forming a wing at (a), along the inside of which is borne the placental strand.

Fig. 5. Longitudinal median section of seed.

Since the above was in type a few much-withered petals have come to light which show the affinity of the plant to Ranunculus. It is, indeed, identical with *R. Andersonii* Gray, which, although figured in the Botany of King's Expedition, I had overlooked. Notwithstanding this, there are yet additional arguments in favor of Beckwithia as a genus. While lack of space forbids the presentation of these at this time, it is necessary to add that the binomial read *Beckwithia Andersonii* (Gray).

DR. HENRY N. BOLANDER, BOTANICAL EXPLORER.

By Willis L. Jepson.

Late in the summer of 1846 a large number of people in the town of Schleuchtern, near Frankfort, in the province of Hessen-Nassau, Germany, were making preparations to emigrate to America. A lad of fifteen, named Henry Nicholas Bolander, a native of the town, his boyish mind filled with thoughts of new scenes and strange lands, pleaded that he be allowed to join the company, a request which was finally granted him. September of the same year saw the German strangers in New York. The destination of the boy immigrant was Columbus, Ohio, in which city he had an uncle resident. This relative planned for him a clergyman's career, and in compliance with his guardian's wishes the youth entered the Lutheran Seminary of Columbus, where he was graduated and duly ordained. He never, however, filled at any time a religious office, and in 1851 he entered as a teacher the German-English schools. Any thought of leading a clerical life was now definitely abandoned; for his desires were not at all so inclined. On the contrary, his tastes were being turned in a very different direction, and by a person whose influence was vastly more potent than that of his uncle. This person was none other than Leo Lesquereux, the nearest neighbor, who introduced him to the study of plants, and who nourished his growing enthusiasm to such a degree that he made botanical trips through Ohio and the neighboring states of Pennsylvania, Michigan, Indiana and southern Illinois. Notwithstanding his active life he was annoyed by illness peculiar rather to persons of sedentary habit, and, having acquired four months' leave of absence, he visited Germany and returned with restored health. This was not, however, of lasting benefit, and four years later his physician advised a permanent change of climate, and he determined to remove his residence to California.

The 5th of December, 1861, saw him landed in San Francisco. The dry season had been broken by rains, which were long continued; it was then raining and it continued to rain until May of the following year. The winter of 1861–62 was a "wet winter," one

Henry N. Bolander

ERYTHEA, VOL VI,
PLATE II.

of those rainy seasons characteristic of California at long intervals, when the periods of dry, sunny weather between successive rainfalls vanish and there is scarcely any surcease of moisture. The memories of that rainy season and its attendant floods in a country in which there had been little opportunity to improve upon the Spanish-Californian's means of conveyance and communication, has become in a degree humorously celebrated. Bolander was in a way benefited, since in rain-beleaguered San Francisco he became happily acquainted with the pioneers, Dr. Kellogg, Dr. Behr, Mr. Bloomer, Mr. Stout, Mr. Redding and others of the California Academy of Sciences, and also with the members of the State Geological Survey. As soon as opportunity offered he began to collect with great zeal; the surroundings of San Francisco he found excellent fields for mosses, lichens and phænogamous plants.

In order that the man may be oriented with the times a foreword may here be written concerning previous exploration and the foundation of the Survey.

Prior to the conquest of the Mexican Province of Alta California in 1847, the Pacific Coast of North America had been visited by many scientific men; but none had become residents, and none save Hartweg and the members of the Wilkes Exploring Party of the United States Government had gone inland but a few miles from the immediate coast settlements. Even the intrepid Douglas, about whose name more than all others we are pleased to associate the romance of botanical exploration, did not traverse the inner Coast Ranges, and knew only by rumor or passing word from the pastoral Spanish people of the great Californian Valley and the Sierran wall defending its eastward border. Nearly twenty years after the visit of Douglas came striking historical events,—the raising of the Bear Flag at Sonoma; the occupation of the old capital of Monterey by the United States naval forces; the discovery of gold in the American River. In the crowded train of events which followed rapidly and only ten years after the assembly of the Constitutional Convention, the Legislature of California established a State Geological Survey. The act was approved by the governor, April 21, 1860, and J. D. Whitney was selected to be State Geologist. The botanist of the Survey was Wm. H. Brewer. Of Brewer's work and honored character it is not here to speak. Brewer left the Survey

late in 1864 to accept a professorship in the Sheffield Scientific School of Yale University, which he still holds. This gave opportunity to H. N. Bolander, an enthusiast, who succeeded him as State Botanist and who is scarcely less celebrated than Brewer in the history of that time. Bolander remained connected with the Survey until or nearly until its discontinuance, and for several years thereafter, until about 1873, vigorously prosecuted field work throughout California; and it may be said that the period from 1864 to 1873 practically comprises that portion of his life of direct interest to botanical history on the Pacific Coast.

The field work of no explorer in California, unless that of Brewer be excepted, has been more extensive. Succeeding an exploration of the regions of Mt. Diablo, Mt. Tamalpais and the San Francisco peninsula south to Santa Cruz, he extended his excursions northward and in 1864 reached the Russian River Valley and Ukiah, and in the following year the coast region between Eureka and the Navarro River. These regions, partly or wholly unexplored hitherto, yielded a large number of striking and remarkable new forms; indeed, some of the localities were so attractive that they were revisited.

In 1866 he was sent by Dr. Whitney, Director and Geologist-in-Chief to the Survey, to Long and Round Valleys, in Mendocino county. This was early in the year,—in April. In June he joined Clarence King's party for the Mariposa Big Tree grove, Yosemite Valley, and the High Sierras. On September 1, 1866, the party ascended Mt. Dana and passed, the next day, through Bloody Cañon to Mono Lake. In 1867 he was detailed for field work in the Eel River country and about Red Mountain, which proved, as to phænogamous plants, a locality of exceptional interest. An appropriation for the continuance of the Survey had become extremely doubtful, and Bolander, in consequence, accepted a position in the Cosmopolitan School in San Francisco; his vacations, however, he continued to devote to field work, collecting for the most part in regions adjoining the newly-constructed Central Pacific Railroad.

In the year 1871 the subject of our sketch was nominated and elected to the office of State Superintendent of Schools, serving the full term—that is, until December, 1875. His travels in this

capacity took him over much of the State, and he was thus enabled to collect at Truckee, Sierra Valley (where he visited J. G. Lemmon), Yreka, San Diego, and St. Julian; on April 12, 1873, he ascended Cuyamaca Mountain, near the latter place, and passed through San Felipe Cañon to the desert. On his return trip he visited Los Angeles, San Simeon Bay, where Pinus insignis forms extensive groves, and many other localities.

In systematically-directed exploration of the State Bolander was preceded only by Brewer. What a field was theirs! Very many species, it is true, had been made known, but hundreds of others of our characteristic trees, shrubs, and herbs had not been discovered, and it may be said, and be very near the truth, that the best of California's botanical heritage was yet to be exploited. And consider that heritage! The gang plow, the ax of the logger, the burning brand of the sheepman, had scarcely initiated the processes of transformation and destruction that attend the westward steps of the Anglo-Saxon. So remarkable was the annual vegetation of the Sacramento Valley plains that scarcely a professional man whose travels led him across the valley, nor even a teamster of the mining freight wagons of the period, will not, at a word, grow reminiscent of that scene of prodigality in the vernal season.

Naturalists rarely expect a first-rate collector to divide his attention between phænogamous and cryptogamous plants; even a capable moss collector has most frequently a poor eye for fungi or algæ. To this general rule Bolander was a notable exception. But concerning his versatility in this regard extracts from the writings of his correspondents may well be given here.

Duplicates of his collection of mosses were sent to Leo Lesquereux, who, as being primarily responsible for the direction of his youthful scientific tastes, may speak first. The extract which follows is taken from the Transactions of the American Philosophical Society, 1869: "Recently a young botanist, Mr. Hy. N. Bolander, formerly of Columbus, Ohio, having taken up his residence at San Francisco, has given particular attention to the study of the Californian mosses, and in less than one year has collected as many species as all the other collectors together. Mr. Bolander's contribution is rendered particularly interesting to bryological science, not only by the number of species, but by the great care

manifested in collecting and preserving fine specimens in a perfect state of maturity, and in such abundance as to render examinations satisfactory, and also noting the time of maturity, the habitat, and all circumstances necessary to arrive at a correct knowledge of the species in all its phases." Further, as evidencing the zeal of his correspondent, he adds, "He sent me by mail, almost weekly, examples of species new for California." The moss flora had not been studied in the field, and its richness was scarcely suspected.

Professor Tuckermann, of Amherst, received the lichens of the State Survey collection, and makes especial mention of Bolander's services to Californian Botany in the preface to his paper on the "Lichens of California, Oregon, and the Rocky Mountains," 1886. The algæ were sent to Lenormand of Vire, France; the hepaticæ were forwarded to Austin, of New Jersey (who was recommended by Torrey as "industrious and sharp"), and, later, to Gottsche, of Altona, Germany; while to Dr. Engelmann, of St. Louis, was sent a large duplicate set of oaks, coniferæ, and junci. Professor Parlatore, of Italy, received a full set of the conifers, and miscellaneous duplicates were presented to De Candolle at Geneva, and Baron von Müller, of Melbourne.

The flowering plants, as a rule, went to Torrey and Gray, but mostly to Gray, who assisted the young botanist in procuring some expensive sets (such as Boott's Carices), concerning groups in which he had acquired an especial interest. He was more devoted, doubtless, to the Gramineæ than to any other family. The few papers that he published in the Proceedings of the California Academy* relate mostly to the grasses, and his knowledge of the Californian species must have been considerable, and, considering the facilities for their study, very exact. We can judge how limited were the facilities

*On Grasses in the Herbarium of the Academy, and Grasses found in the vicinity of San Francisco, vol. ii, 177. Descriptions of New Plants, l. c. 179. The Genus Melica, in California, l. c. vol. iv, 101. The Genus Stipa in California, l. c. 168.

Bolander was for a time in the early seventies editor of the *California Teacher*, a monthly magazine. In volume xii may be found a series of articles on botany for the schools, in which some of the most common families of flowering plants are described and illustrated by full-page drawings.

when it is recalled to mind that the chief resource for the study of flowering plants in the earliest days of the Academy was Dr. Behr's copy of Endlicher's Genera Plantarum.

Of the little that Bolander put in print, there is most interest for me in a forty-four-page pamphlet entitled, "A Catalogue of Plants Growing in the Vicinity of San Francisco," by Henry N. Bolander, late State Botanist, San Francisco, 1870. The catalogue, now a rarity, is a large quarto, and was published by the pioneer firm of A. Roman & Co., whose typographical and press work was of a very high character. The text is disposed in three columns, giving the "Latin Name," "English Name," and "Natural Habitat" of each species. The limits of the region included are not defined, but a few localities appear, such as "Mark West Creek," "Napa Valley," "Monte del Diablo," and "Monterey." The catalogue includes the flowering plants, ferns, mosses, hepatics, and lichens, the list of grasses and sedges being especially full; in all, about thirteen hundred species are recorded.

The range of Bolander's activity can be illustrated in another way. The distribution of his plants brought him into correspondence with the prominent botanists of the time in America and Europe; there are few names that one does not find in the interesting budget of correspondence which he carefully preserved. No one wrote more cheery epistles than Dr. C. C. Parry—chatty and inspiriting accounts of his comings and goings from Davenport to Cambridge and across to Europe; no one referred with greater pleasure to the interviews and visits he had had with botanists and pioneer Californians on the Pacific Coast; and no one was more appreciative of Bolander's generosity. An equally good friend was John Torrey, who, as he said, preferred visiting California to any other part of the world; he expressed his great regret at not meeting Bolander at the Agassiz Reception at the California Academy in 1872, and runs on so much concerning things Californian that he asks his correspondent not to accuse him of "narrative old age," a phrase which, by the way, occurs also in the opening chapters of Scott's "Waverley." Torrey's friendship was shown in a particular case most notably, for it was at his instance that Lafayette College conferred upon the Californian explorer the title of Doctor of Philosophy. Prof. D. C. Eaton, of Yale, wrote in reply very exact

and instructive accounts of plants sent, their place in the genus, and the geographical distribution of the species. Among others, Horace Mann had lichens from Bolander; some fungi were sent to Prof. Farlow, and carices to Stephen J. Olney, of Providence, Rhode Island.

It would not be easy to estimate the number of species new to science made known by the explorations of Bolander, but some suggestion may be had from the appended list * of species of flowering plants which bear his name. Bolandra, a genus of Saxifragaceæ, was named in his honor by Gray.

The latter half of Bolander's life is briefly told. His connection with the office of State Superintendent did not terminate happily, but none of the friends who had acquaintance with him during his fairly long and active life ever questioned his integrity and honesty of purpose. His great faults were over-generosity and undue sensitiveness. An estimate of the man's personal character is, for the writer, not easy to formulate. This were better done, by far, by

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*The following list of species was kindly compiled by Mr. M. W. Gorman, of Portland, Oregon, and is thought to be fairly complete; the number of cryptogamous plants, especially of mosses, liverworts, and lichens, named after Bolander, must have been quite many.

1. Ranunculus Bolanderi Greene.
2. Arabis Bolanderi Watson.
3. Staphylea Bolanderi Gray.
4. Astragalus Bolanderi Gray.
5. Lathyrus Bolanderi Watson.
6. Trifolium Bolanderi Gray.
7. Horkelia Bolanderi Gray.
8. Tellima Bolanderi Boland.
9. Callitriche Bolanderi Hegelin.
10. Cicuta Bolanderi Watson.
11. Glycosma Bolanderi Gray.
12. Eulophus Bolanderi C. & R.
13. Podosciadium Bolanderi Gray.
14. Galium Bolanderi Gray.
15. Artemisia Bolanderi Gray.
16. Balsamorrhiza Bolanderi Gray.
17. Bigelovia Bolanderi Gray.
18. Helenium Bolanderi Gray.
19. Hieracium Bolanderi Gray.
20. Madia Bolanderi Gray.
21. Microseris Bolanderi Gray.
22. Phalacroseris Bolanderi Gray.
23. Senecio Bolanderi Gray.
24. Gilia Bolanderi Gray.
25. Phacelia Bolanderi Gray.
26. Mimulus Bolanderi Gray.
27. Scutellaria Bolanderi Gray.
28. Polygonum Bolanderi Brewer.
29. Allium Bolanderi Watson.
30. Lilium Bolanderi Watson.
31. Erythronium revolutum Smith, var. Bolanderi Watson.
32. Eleocharis Bolanderi Gray.
33. Calamagrostis Bolanderi Thurber.
34. Cinna Bolanderi Scrib.
35. Elymus Bolanderi V. & S.
36. Poa Bolanderi Vasey.
37. Scribneria Bolanderi Hack.

some one who had not only the advantage of close personal acquaintance, but, further, the advantage of intimacy of the times.

In 1878 he went to Guatemala, and later to Chile and Peru, and, it is said, to South Africa and Madagascar; certainly to Europe. In September, 1883, he returned to the Pacific Coast, by way of San Antonio, Texas, and Monterey, Mexico, and took up his residence in Portland, Oregon, where he taught modern languages in St. Helen's Hall and in Bishop Scott Academy. There he lived, honored by all who knew him, until death came, August 28, 1897.

EXPLANATION OF PLATE.

Plate I. The illustration is copied from an original photograph in the Torrey Album, preserved in the Herbarium of Columbia University, and secured for ERYTHEA, through the kindness of Dr. M. A. Howe. The photograph is said to be a good likeness of Bolander in the days when he was a member of the State Survey.

REVIEWS AND CRITICISMS.

Lessons with Plants. Suggestions for seeing and interpreting some of the common forms of vegetation. By L. H. BAILEY. [MacMillan & Co., New York. $1.10.]

This volume is a product of the author's active interest in the development of nature-study in the common schools of New York State. It is written largely from a horticulturist's standpoint, and, on that account, is freighted with suggestions of what may be learned, not from the unusual or highly curious, but from common, every-day things. Certainly no book for the schools has appeared in many years in which there is so much new matter. The chapters on "The Struggle for Existence in a Tree-top," "Knots and Knot-holes," "The Fruit Spur," "Characters in Winter Twigs," "The Eventful History of an Apple Twig," are especially fresh and entertaining. Here, too, is abundant opportunity for legitimate play regarding the reason of things.

Professor Bailey remarks in his preface: "It is often said that a person may learn a good deal about plants with only a very ordinary hand lens. This is true; but he can also learn a good deal

without any lens." That is good doctrine, and the chapters have been constructed with this thought in mind. But why omit a study of exogenous and endogenous stems or of increase in girth in stems, for a comprehension of which no lens is needed? And why for nature-study in the secondary schools retain such chapters as "The Naming of Species" and "The Classification of Species"? For it must be remembered that the book is a series of nature-study lessons merely, which have little or no connection one with the other, no attempt, apparently, having been made to connect the chapters by any sort of life-history thread.

Throughout the book Professor Bailey's forceful style has been charmingly adapted to the matter in hand. There are nearly four hundred and fifty illustrations, of excellent character, and, with the fewest exceptions, original. To teachers engaged in nature-study work the book will be found most attractive.—W. L. J.

NEWS NOTES AND CURRENT COMMENT.

MR. J. B. DAVY, of the University of California, has been elected an Associate Member of the International Academy of Geographical Botany, of Paris.

MR. J. W. BLANKINSHIP, an assistant of Professor Goodale, at Harvard University, has been appointed Botanist to the Montana Agricultural College.

STANFORD UNIVERSITY, at its June commencement, conferred upon Mr. Walter Shaw, Instructor in Botany in that institution, the degree of Doctor of Philosophy.

MR. E. O. WOOTON, who has been spending two years in graduate work at Columbia University, returns this year to the professorship of Botany in the Agricultural College of New Mexico.

DR. E. LEWIS STURTEVANT, a student of plant variation, died in July, at his home in Framingham, Mass. He was most widely known, perhaps, for his extensive experiments upon maize, his classification of the agricultural species being of great value to botanists as well as agriculturists.

STAPFIA COLUSANA Davy

STAPFIA, A NEW GENUS OF MELICEÆ, AND OTHER NOTEWORTHY GRASSES.

By J. Burtt Davy.

Stapfia. Inflorescence a terminal spike-like raceme, the upper portion of the rachis bearing no spikelets, or only a terminal one, but clothed with narrow empty glumes of different shape and texture from the flower-inclosing glumes below. Spikelets few-flowered, their glumes usually all flower-inclosing except the uppermost 1 (rarely 2), flowering from below upwards. Flowers all hermaphrodite; glumes hyaline-scarious, amplexicaul, broadly flabellate, flat except one narrowly infolded edge the other edge somewhat oblique, 12–18-nerved, the nerves connected above by delicate cross-veins. Palea like its glume but narrower, 4 (rarely 2) nerved. Stamens 3. Styles 2, long, connate below, the upper two-thirds barbellate. Fruit unknown. Annual. Leaves broad, short, acuminate, exceeding the short internodes; nerves not connected by cross-veins. Peduncle short, sometimes bracteate; raceme usually at first included. Rachilla apparently articulate between the flowers; empty glume flat, terminal. Anthers rose-colored.

A remarkable genus, differing from the other 5 or 6 Meliceæ in having usually only 1 empty glume above the flowers. Related to *Anthochloa* of the Andes of Peru and Bolivia, by the remarkably broad, flabelliform glumes, and the absence of awns, but differing from it in having the glumes many-nerved, in the almost entire absence of empty glumes at the base of the spikelet,* and in the longer styles.

Named in honor of Dr. Otto Stapf, Assistant for India in the Herbarium of the Royal Gardens, Kew, who has elaborated the Gramineæ for the *Flora Capensis* and (in collaboration with Sir Joseph Hooker) for the *Flora of British India.*

Among the bract-like empty glumes of the upper part of the rachis, which do not subtend spikelets and the empty glumes sub-

*The 2 or 3 uppermost spikelets are subtended by linear or lanceolate linear empty glumes.

tending the uppermost spikelets, is to be found almost every gradation in form and texture between the narrow, foliaceous bract subtending the whole raceme, and the flabelliform sub-scarious flower-inclosing glumes of the lower spikelets. Moreover, when there are two empty glumes subtending a spikelet, the lower appears to be attached to the rachis, the upper to the rachilla, as with the bracts and bracteoles subtending peduncles and pedicels in some Umbelliferæ. From a theoretical point of view, therefore, *Stapfia* may be looked upon as originally possessing a rachis clothed throughout with diminutive leaf-like bracts (empty glumes), each bearing a spikelet in its axis. We may suppose, further, that these eventually disappeared from the lower part of the rachis, on account, perhaps, of the crowding of the spikelets, but persisted on the upper part whenever the spikelets themselves were suppressed or very much reduced. The homology between the glumes of grasses and the bracts of more highly developed plants seems, therefore, to be clearly demonstrated in this genus.

S. Colusana. Roots fibrous. Stems decumbent, then ascending 7–15 cm. high, leafy. Leaves overlapping, pale green, scarious between the nerves, loosely folded around the culm, but not differentiated into sheath and ligule, about 12 mm. wide at the middle, tapering to each end, 3½–7½ cm. long, keeled on the back above, plicate, minutely ciliate with raised glands on the margins and nerves. Peduncle sometimes bearing a lanceolate-linear, gland-ciliate bract, resembling the empty glumes on the upper part of the rachis, but larger. Raceme pale green, at first partially included, never much exserted, 3½–7 cm. long, 8–11 mm. wide, cylindrical; the upper one-sixth or one-fourth of the rachis bare of spikelets, clothed with empty bracts, these lanceolate-linear, 7–8 mm. long, ¾–1½ mm. wide at base, with 6–9 prominent green nerves, ciliate with raised glands on the nerves and margin. Spikelets sub-sessile, 1–5- (usually 5-) flowered, 6–7 mm. long, imbricate. Flowers proterandrous. Flower-inclosing glumes imbricate, broadly flabelliform, 5 mm. long, 4 mm. broad, minutely ciliate-fringed; nerves glandular like the leaves. Palea emarginate, minutely ciliate-fringed. Lodicules very minute, apparently adnate to the base of the filaments. Anthers yellowish-green while inclosed, then rose-colored; 3–4 mm. long, about 1 mm. wide. Styles 4½–6 mm. long (includ-

ing stigmatic portion). Ovary apparently glabrous; fruit unknown.

A laxly decumbent, pale-green, alkali grass, remarkable among California grasses for the tassel of empty glumes at the apex of the raceme, the fan-shaped, many-nerved flower-inclosing bracts, and the broad, loosely-sheathing leaves undifferentiated into sheath and blade. The leaves are sessile, and their loosely-sheathing bases appear to demonstrate clearly that the homology of the sheath of grass-leaves is with the base of the blade, and not with the petiole and its stipules.

Type locality: near Princeton, Colusa County, California, bordering rain-pools on the hard, uncultivated, alkali "goose-lands," beside the stage-road to Norman; May 26, 1898, *J. Burtt Davy.*

Type specimens in the herbarium of the University of California, at Berkeley, in the United States National Herbarium, Washington, D. C., and in the Kew Herbarium.

It was not possible to obtain samples of the peculiar soil in which *Stapfia* grew for analysis of salt-content, but soils from adjacent areas, within a distance of 1 or 2 miles, showing the same color, texture, and vegetation (except for the absence of this and one other grass) have been analyzed by Dr. R. H. Loughridge, of the Agricultural Experiment Station. These show the following salt-content in 5 feet of soil.

	Samples 1–5.	Samples 6–11.
Sodium sulphate,	8.490 per cent.	1.098 per cent.
Sodium carbonate,	.017 per cent.	.476 per cent.
Sodium chloride,	.171 per cent.	.009 per cent.
Total salts,	8.678 per cent.	1.583 per cent.

Heleochloa schœnoides (L.) Host. Growing with *Stapfia Colusana*, I found a curious little grass which appeared to be a *Crypsis*, but which failed to agree in essential points with the descriptions of *C. aculeata.* Dr. Stapf pronounces it to be a "very dwarf state of *Heleochloa schœnoides*, Host (*Crypsis schœnoides* Lamk.) with the habit of *Crypsis aculeata.*" It is a native of the Mediterranean region, and temperate Asia, and has been found as a ballast weed "sparingly introduced" on waste ground near Philadelphia. Its occurrence in the Sacramento Valley of California is exceedingly interesting. At first sight it might seem indubitable that it had been introduced with seed-grain, along with *Centaurea*

Melitensis, C. Solstitialis, C. Salmantica, and other South European weeds. But the soil on which it was found is uncultivated, and I was informed by Mr. John Boggs, of Princeton, who has resided in that neighborhood for over forty years, that that particular area had never been broken to the plow within his memory, having always been considered worthless ground. Nevertheless it is possible that seeds have been dropped from wagons carrying seed-grain from river boats to the rich wheat lands eight or ten miles to the westward, before the advent of the branch railroad which now crosses the "goose-lands." The very diminutive state of the plant is probably due to the hardness and insolubility of the soil.

Phalaris paradoxa (L.). This interesting and remarkable "Canary-grass" of the Mediterranean region has now become naturalized in California. The first specimen brought to my notice was collected by Mr. A. B. Leckenby, near Petaluma, Sonoma County, in 1896. Last May I found the plant growing in abundance near Princeton, Colusa County, in a wet spot beside the stage road to Norman.

Briza maxima (L.). Also of the Mediterranean region, cultivated in gardens for ornament, and found as an escape in Massachusetts, Michigan, and Colorado, according to Professor Beal, has now been found growing spontaneously near Healdsburg, Sonoma Co., Cal., by Miss Alice King.

My sincere thanks are due to the Director of the Royal Gardens, Kew, for having had my specimens of *Stapfia* and *Heleochloa* compared with material in the Kew Herbarium, thus minimizing the risk of adding to the already overwhelming mass of grass synonyms.

EXPLANATION OF PLATE.

1. *Stapfia Colusana* Davy, two-thirds natural size.

2. Spikelet; the proterandrous flowers spread out to show their relative positions. In the lower flower on the left the protruding filaments from which the dehisced anthers have already fallen, as well as the barbellate styles, are shown.

3. Flower-inclosing glume, inner view; folded portion laid back.

4. Palea; front view, showing the two smaller nerves on the olded edges; the two larger nerves occur at the folds.

5. Ovary and styles, enlarged five and one-third times.

6. One of the upper, empty, bract-like glumes; inner view, showing the marginal glands.

Nos. 2, 3, 4, and 6 are enlarged two and two-thirds times.

The plate is from a pen-and-ink drawing, by Mrs. J. Burtt Davy.

REVIEWS AND CRITICISMS.

Plant Life, considered with special reference to form and function. By CHARLES REID BARNES, Professor of Plant Physiology in the University of Chicago. [Henry Holt & Co., 1898.]

In the January, 1898, number of the *Botanical Gazette*, Professor Barnes reviewed Curtis' "Text-book of General Botany," and made this initial statement, "The making of a book is now looked upon as almost reprehensible, and the writer is mentally challenged by his fellows to show valid reasons for its publication." After discussing the various phases of the book, the reviewer ends in this wise: "Through these considerations we are led to the conclusion that the book before us is a very convenient compendium of the well-known facts of botany, and a laboratory guide with useful suggestions as to illustrative material. In these things it is no better than its predecessors; and this, together with some faults in plan and execution, deprive it of a valid *raison d'être.*"

An examination of Professor Barnes' text-book shows, as indeed the preface states, that "the whole book is simply a restatement of widely-known facts." Although it is certainly, in some aspects, much superior to the text criticized by Professor Barnes, its superiority to the most recent standard texts is not clear to us, and it is difficult, therefore, to apply the author's criteria to his own book and give it the words of approval.—W. L. J.

SHORT ARTICLES.

NEW METHOD OF MAKING BOTANICAL CHARTS.—A very cheap and easy method for making colored charts and diagrams is found in using ordinary blackboard crayons on unbleached cotton cloth. The crayons cost twenty-five cents per box, and

the cloth, seventy-two inches in width, can be purchased for fourteen cents per yard. In order to fix the colors on the cloth and prevent them from smudging, the crayons are allowed to soak in melted paraffine for a few moments before using. The chalk readily absorbs the paraffine without becoming soft or otherwise deteriorated as a drawing medium. When drawing on the cloth there is sufficient friction produced to melt the paraffine, which enters the fabric, carrying the chalk with it. This enables one to make clean permanent lines, and the drawing can be folded or rolled up without fear of smudging or obliterating in the least. Where colored figures are desired, almost any effect can be produced by the proper blending of the ordinary colors. Thus if a green is desired, one first applies the blue crayon and then the yellow, varying in quantity according to the tint of green desired. If one is at all skilful at drawing, very good pictures, much resembling and as effective as oil paintings, can be produced. The colors are permanent, and charts thus made can be kept for any length of time. Upwards of a hundred are now in use in the Botanical Department of the University of California, and they vary in style from karyokinetic figures to large habit pictures of insectivorous plants. To those who have large classes in botany or zoology this method of making pictorial demonstrations for the lecture room will be found very desirable and inexpensive.—A. A. LAWSON.

PLANTS IN FLOWER IN NOVEMBER AND DECEMBER, 1897.—*Iris longipetala* and *Iris Douglasiana* were both found in bloom on the Mission Hills, November 18, by Mrs. W. S. Chandler. On Thanksgiving day, November 25, they were seen and collected by the writer. They are still in bloom, May 25, and numerous buds give promise that they will not cease blooming before June.

On Thanksgiving day an afternoon tramp over the Mission Hills, near the proposed new park, resulted in finding fifty-eight species in bloom. Twenty-seven of these were indigenous, and the others either introduced or cosmopolitan.

An excursion over the Presidio hills and gulches on Christmas day was almost as rich in results. Fifty-five species were found in bloom, of which thirty-eight were indigenous. On December 26 Mt. Tamalpais was visited, and the tramp to the Rock Spring

via the Throckmorton and West Point Trails, and back to Mill Valley *via* the Boot-jack Trail and the road through Sequoia Cañon and over the hill, discovered eighteen other species, all indigenous. They must have been in bloom the day before, so that we can count seventy species or more in bloom near San Francisco on Christmas day.—ALICE EASTWOOD.

NEWS NOTES AND CURRENT COMMENT.

NATAL PLANTS, Vol. I, part I, by J. Medley Wood, A. L. S., curator of the Natal Botanic Gardens, Durban, and Maurice S. Evans, F. Z. S., is in the style of the English colonial publications. There are fifty plates, accompanied by descriptions of the species, and with notes on their distribution, economic value, and native names. The work should accomplish much in the advancement of popular, as well as scientific, knowledge of the botany of Natal.

THE first part of the second series of "Minnesota Botanical Studies," issued June 15, 1898, contains, among other papers, "A method of determining the abundance of secondary species," by Roscoe Pound and Frederic E. Clements; "New and Interesting Species from New Mexico," by A. A. Heller, and "Some Musci of the International Boundary," by John M. Holzinger.

THE latest book by Prof. L. H. Bailey bears the title "Garden Making. Suggestions for the Utilizing of Home Grounds." The volume discusses "The Plan of the Place," and the securing of landscape effects, "Planting of the Ornamental Grounds," "The Fruit Plantation," and "The Vegetable Garden." It is, perhaps, especially to people who have only a limited area in which to give expression to their gardening activity that the four hundred pages may be recommended as a great aid and an inspiration. [MacMillan & Co., New York, $1.00.]

THREE years ago Mr. Geo. Hansen issued an "Enumeration and Classification of all Hybrids of Orchids published up to October 15, 1895." In the preface, and in other places in the text, the author

gives free expression to his personal views, which will interest gardeners and cultivators, and perhaps some other people. Mr. Hansen, who is a German by birth and university training, occasionally gets lost in the intricacies of the English language, as on page 187, where he says: "And if we should be disappointed, it is convenience that names objects, and if my name hits the head of the nail, and drives it home, too, let it remain and take root." In the phrase of *America-occidentalis*, this might be called "a lofty disregard of consecutive metaphor." The second supplement to the enumeration was issued May 1, 1897; those who need it would do well to address the author at Berkeley, Cal.

THE PROBLEM of the affinities of the simpler monocotyledons is engaging the attention of Prof. D. H. Campbell, of Stanford University. In "A Morphological Study of Naias and Zannichellia" (Proc. Calif. Acad., 3d ser., Bot. i. 1–62), he reexpresses his belief that the monocotyledons and dicotyledons are of entirely distinct origin, and if the view be accepted that there is a probable direct connection of the monocotyledons with the pteridophytes, it is among such simply-organized aquatics as Naias or Zannichellia, that the point of contact is to be looked for. Naias and Zannichellia are found to have many points of structure in which they agree, but the relationship to each other does not seem, to the author, sufficient to warrant placing them in the same family. Both of the species investigated are found in California, and Pacific Coast botany is to be congratulated upon the careful, detailed study which Professor Campbell has begun upon plants which occur in our region.

NOTES ON THE FLORA OF MARIN COUNTY.—II.

By Alice Eastwood.

Geranium Sibiricum L. This is abundant on the Abbott Ranch, at the entrance to Bear Valley. The specimens agree exactly with one identified by Dr. William Trelease, and collected by Miss Edmunds, also in "Bear Valley." Since Bear Valleys are to be found all over the State, the exact locality was uncertain. The rediscovery of the species in the beautiful valley near Olema, now identifies the locality.

Stellaria crispa Cham. & Schl. This is another interesting northern plant, which has its home in Bear Valley. Specimens were collected May 30th, 1898, near where the Glen Ranch road branches off from the Bear Valley road. It is a pretty plant, adapted to beautify rockeries and hanging baskets. The stems are slender and leafy, gracefully hanging over the mossy banks along the roadside, and forming bunches or mats. In the Synoptical Flora, Vol. I, Pt. I, p. 236, this species is said to inhabit "mountainous regions of Northern California to Alaska." Specimens from the following Californian localities are in the herbarium of the academy: Sequoia gigantea Region (Hansen 1102), Mono (Bolander), Summit (M. K. Curran).

Lactuca leucophæa Gray. This has never been reported from California, so far as I have been able to ascertain. It grows in Bear Valley, by the roadside, on the right-hand side as one goes west. It is rare, only two or three plants having been noticed.

Cicæa Pacifica Asch & Magnus. In the herbarium of the Academy there are specimens of this species, collected at Lagunitas Creek, May and July, 1878, by J. P. Moore. I have been on the lookout for the plant during the last two years. On May 29 I happened across a spot where it carpeted the ground. This is across the stream from an old lime-kiln on Olema Creek, which is hidden and overgrown by the trees and brush, like an Aztec ruin in a tropical forest. The plants were from a few inches to a foot in height, both in flower and fruit. The long, thread-like rootstocks were laden with small white tubers.

Goodyera Menziesii Lindl. This was collected by the writer in

bloom, Aug. 13, 1898, near Mason's Camp, on Lagunitas Creek. It is quite abundant over a limited area.

Prunus subcordata Benth. This is described in the "Botany of the Bay Region," without definite localities. It seems to me somewhat rare in the Coast mountains. We have it in the herbarium of the Academy, from Mt. Diablo, collected by Mrs. Brandegee, and from Kent's Cabin, on the road to Bolinas from Ross Valley, collected by the writer in 1897.

THE VIOLETS OF MARIN COUNTY.

1. *Viola canina* L. var. *adunca* Gray. This is widely distributed, generally found on hills near the sea.

2. *Viola ocellata* Torr. & Gray. Not until the spring of 1898 have I found this violet in Marin County. It grows on the bare northern slope of Mt. Tamalpais, along the trail leading from the Potrero to Kent's Cabin. It was surprising to find this violet, associated in my mind with shady woods, growing amid the rocks of a rough trail, and exposed to the unsheltered glare of the sun. It is probably a remnant of a flora which indicates the forests that once clothed that side of the mountain where the traces of former fires tell how it has been denuded.

3. *Viola glabella* Nutt. My attention was called to this by finding it at Mason's Camp, on Lagunitas Creek. In the herbarium of the Academy it is represented by the following specimens: San Gregorio Redwoods, Brannan & Kellogg, May 31, 1870; Paper Mill Creek, M. K. Curran, May, 1888; Punta de Los Reyes, Dr. Kellogg; Lagunitas Creek, at Lagunitas Station, and the locality above mentioned, collected by the writer.

4. *Viola pedunculata* Torr. & Gray. This likes low hills where there is no brush. It is too common to specify localities.

5. *Viola sarmentosa* Dougl. This is always found in redwood forests, where its bright green leaves and yellow flowers frequently carpet the ground.

6. *Viola præmorsa* Dougl. (V. purpurea Kellogg). The plants collected on Mt. Tamalpais grew on the trail leading to the Potrero from the Bill Williams Trail. This slope faces the north. The specimens resemble Hansen's No. 1109, from near Jackson, in Amador County, rather than the form of *V. purpurea* from the Mt. Diablo Range, described in the "Botany of the Bay Region."

REVIEWS AND CRITICISMS.

Contributions to Western Botany, No. 8. By MARCUS E. JONES, A. M. Issued February 21, 1898, pp. 46.

In this "Contribution" Mr. Jones has given publicity to a considerable number of new species, notably of Astragalus, and to discussions concerning old species, concluding the paper with the proposal of a new genus of Compositæ, Inyonia. The place of publication does not appear on this pamphlet, which is given out independently. The author's previous "Contributions" were published as papers in the Proceedings of the California Academy, and in *Zoe*. When he cites a binomial published in these papers he does not quote the Proceedings or Journal in which it appeared but merely the title of his paper, as "A. Uintensis Jones, Cont. VII, 670."

Luckily, for the ready location of citations, when Mr. Jones quotes the name of any author but himself he ignores the title of the paper in which the name occurred, and follows precedent, citing the volume and page of the publication, *Erythea*, *Zoe*, etc., as the case may be. This is only one of many instances of the author's disregard of convention, which is especially noticeable in his specific descriptions, where the name of a new species is immediately followed by the locality, date of collection, and name of collector, information highly useful in itself, but which should not precede the formal diagnosis, custom and reason alike demanding that the more important parts of a description should stand first. The author is least of all consistent; in the very next description we may find the sequence quite reversed. All of the descriptions appear as if informally prepared—as if the facts were set down in the order in which they occurred to the writer, and were not subjected to rearrangement or revision. The absence of literary form in the pages is very marked.

Mr. Jones has opportunity for observing and recording a wide range of valuable facts concerning the Utah flora, than which there is none in the United States more interesting, and is in a position to inform us about many things that it would be worth our while to know. Moreover, he does not merely make species but, when it is found necessary, unmakes them.

We are glad to say that there is a certain sincerity and force

apparent in his work, but the effect of it, unfortunately, is marred by a lack of clearness in presentation—a lack of attendance to rhetoric safeguards and grammatical usage. While lapses in syntax may occasionally happen to many of us not professed purists, the writer's pronouns too frequently fail to keep faith with their antecedents.—W. L. J.

NEWS NOTES AND CURRENT COMMENT.

AN account of the "Ferns of Nicaragua," by B. Shimek, forms the larger part of Bulletin No. 2, Vol. IV, of the Laboratories of Natural History of the University of Iowa. The author calls Tropical America "the fern-paradise of the earth," on account of the total number of species, the number of peculiar species, and variety of form. In the contest for light, some species send their rootstocks upward along the trunks and branches of trees; sometimes the part which connects with the soil dies away, and an epiphyte results, illustrating what is evidently the epiphytic origin of ferns which form no inconspicuous portion of the aerial flora. Twenty plates accompany the text.

A CIRCULAR has been distributed by the United States Department of Agriculture, Washington, D. C., requesting that botanists of the United States, acquainted with the composition of their local flora, cooperate with Mr. F. V. Coville, Chief of the Division of Botany, "in determining the distribution and degree of abundance of the more important of our medicinal plants. Many of these plants are collected on an extensive scale, so that they have become scarce where formerly abundant, and some are in great danger of extinction. It is, therefore, highly desirable that steps should be taken to introduce them into cultivation or to regulate their collection; but this can not be done until we possess a more complete knowledge of their climatic requirements and distribution." A copy of the circular, which lists the more important medicinal plants and provides blank columns for the data requested, will be sent to those who are in a position to assist in the work.

PROF. C. O. WHITMAN, in a paper on "Some of the Functions and Features of a Biological Station" (Science, N. S., vii. 37),

advocates that teaching should have a place in the system of a biological laboratory, as well as research; that the advantage of instruction to the investigator lies in the fact "that power of exposition can be acquired and perfected, by class-work and lectures, to an extent otherwise unattainable." Instruction further cultivates organic unity in work, supplying the conditions favorable to interchange of thought among the workers. He also sounds a warning against the ambition to be prolific, rather than sound, and expresses the great need for "long-continued, concentrated, and coordinated work." He places especial stress upon the necessity of the specialist coordinating his results with the results of other workers. "Physiology is meaningless without morphology, and morphology equally so without physiology. . . . Just think of a physiologist seriously proclaiming to the world that instinct reduces itself, in the last analysis, to heliotropism, stereotropism, and the like. . . . Think of a young morphologist, with all the advantages of the Naples Station, loudly sneering at Darwinism, and spending his wit in derisive caricatures of general truths beyond the horizon of his special work and thought. And shall we forget the physiologist, whose philosopher's stone is the search for his ancestry among the arachnids? Or the anatomist, who reverses his telescope to discover that his science begins and ends in terminology? And could we, much as we might yearn for such a benediction, forget the omnipresent and omniscient systematist, whose creed is summed up in priority?"

THE New England Botanical Club proposes to begin the publication of a monthly sixteen-page illustrated journal. It will deal primarily with the flora of New England, especial attention being given to rare plants, extended ranges of distribution and newly-introduced, as well as newly-described, species. Dr. B. L. Robinson, in the *American Naturalist* for June, says that "it may seem remarkable that with the many existing botanical periodicals it should be thought necessary to establish new ones, but it is clear that the journal here contemplated will be devoted to a field not at present cultivated by any existing periodical, namely, the local flora of New England. The journal will, doubtless, be largely systematic, and will attempt to do for New England what such periodicals as the

Deutsch Botanische Monatschrift, Œsterreichische Botanische Leitschrift, etc., have long done so admirably for the European regions they cover. In the present enthusiasm for histology, cytology, œcology, and vegetable physiology, it is not uncommon for a botanical student to plunge into structural problems of extreme technicality without adequate systematic training to give him a proper sense of proportion in his work. To know well the different groups of some one local flora is not only in itself a great source of pleasure, but is a most excellent preparation for subsequent histological or physiological study. There is, furthermore, a great deal still to do upon the systematic botany of New England. Some of the most common species of plants are proving themselves to be puzzling aggregates of closely-related forms, each of which must be studied separately before its proper status and exact distribution can be learned. The flora is constantly changing, through the extermination of species in certain localities, and the still more common introduction of plants of the Old World. There are many reasons why these changes should be carefully watched and duly recorded. Papers dealing with these matters, however, are chiefly of local interest, and lose much of their instructive power and significance if published in a journal remote from the field they cover."

THE Experiment Station literature concerning weeds is perennial. Rarely does any of it deserve special notice, but Prof. A. S. Hitchcock, of the Kansas Agricultural College, has taken up a somewhat neglected phase of the weed subject, and devotes Bulletin No. 76 of the Manhattan Experiment Station, to a study of vegetative propagation in the perennial weeds of Kansas. The drawings form a feature of the report, the characteristic underground, or creeping organs, of each species being well illustrated.

Professor Tourney, of the Arizona Agricultural Experiment Station, has written "Something about Weeds," listing fifty species in Bulletin No. 22. Of these fifty, regarded as weeds, it is suggestive that only eleven are introduced in Arizona, the remainder being native plants, which find places more to their liking in cultivated fields.

Those who are interested in the travels of plants, should know that another American species has turned emigrant; *Argemone*

Mexicana is becoming a troublesome weed at the Cape of Good Hope, according to the Government Botanist, Mr. Mac Owan.

DR. AUGUSTINE HENRY predicts, in a letter to the *Kew Bulletin* of the December issue, 1897, that in the twentieth century, the province of Yunnan, China, where he is now collecting, will be found to have ten thousand species of phanerogams and ferns. Many difficulties are encountered in botanizing in the country. In the words of the writer, "Money is not what is wanted, but time, oceans of time. Nothing astonishes people at home so much as the fact, a real fact, that in countries like China you can not do everything with money. Patience is more valuable. I can get a good deal of work out of Chinese on a trip, when I am with them, but not otherwise. The root of the matter is an absence of nervous energy."

This is the same explorer who, ten years or so ago, made an attempt to employ the natives in collecting, but as they continually brought in the same things, a premium was offered for new plants. The Chinese thereupon fell to making new species in a manner which would have quite confused the ardent devotees of the practise in some other parts of the world, and, curiously enough, this was accomplished by a process of synthesis (not of segregation). *Persiflage* aside, however, the stems, foliage, and flowers of different plants were so cleverly joined that the finished product eluded casual examination, and, it is said, one of these "new species" was actually published and illustrated in the Icones Plantarum; for this statement we can not vouch, but if it be true, the people of the Royal Gardens may remember that California discovered thirty years ago—and celebrated it in verse—that the "heathen Chinee" had developed certain characteristics far more highly than members of our English-speaking race.

The subscription price, $1.50, for Vol. VII, 1899, is now due, and should be remitted without delay to ERYTHEA, Berkeley, California. No. 1, Vol. VII, will be published January 5, 1899.

ERRATA.

Page 4, line 14, for Juniperus Californica read Juniperus Utahensis (?).
" 16, " 32, for vicinity read Vicinity.
" 23, lines 21, 24, 26, 30, read Dish for Disk.
" 24, " 1, 6, 10, 13, 16, read Dish for Disk.
" 28, line 15, read order for Order.
" 88, " 16, for Fruit read First.
" 90, " 35, for Rechi read Rechè.
" 91, " 7, for 4-8 inches read 4-8 lines.
" 91, " 30, for then read these.

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